

T R E A T I S E

ON THE

SYNOCHUS ATRABILIOSA,

A CONTAGIOUS FEVER,

Which raged at Senegal in the Year 1778, and proved fatal to the greatest Part of the Europeans, and to a Number of the Natives :

To which is prefixed, a Journal of the Weather during the Prevalence of that Disease, with Remarks on the Country, formerly read at the Royal Society :

And annexed to it, a short Reflexion on the Gum Trade of Senegal, and the Importance of the Place on that Account ; concluding with an Argument concerning the bad Consequences, which must attend the present Mode of sending Convicts to Africa for Soldiers.

BY J. P. SCHOTTE, M. D.

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M,DCC,LXXXII.

Heu miseros homines, quos contra militat aër,
Quorum pernitiem motæ jurasse procellæ
Et tempestates tractu variante, videntur !
Mox etenim coelo descendens plurimus imber
Corpus inerme ferit, mox artus Sirius urit.

HEBENSTREIT.

Journal of the Weather at Senegal, during
the Prevalence of a very fatal putrid
Disorder, with Remarks on that Coun-
try : Addressed to JOSEPH BANKS, Esq;
P. R. S. by J. P. SCHOTTE, M. D. and
read at the Royal Society, May 11,
1780.

S I R,

HAVING kept a meteorological journal
at the island St. Lewis; in the river Sene-
gal, in Africa, during a time when the greatest
part of the garrison, and a great number of the
inhabitants on the island as well as on the con-
tinent, died of a putrid disorder, I communi-
cate the same to you, as I thought this fatal
circumstance a sufficient reason to make it ac-
ceptable to the Society over which you preside;
hoping, that it may afford matter to determine
the cause of it, and lead to find out remedies
to prevent it in future in the like climates.

Previous

Previous to the journal, in order to illustrate it, I think it requisite to make a few remarks on the situation of the island, the country about it, its seasons, the manner and time in which the disorder appeared and ceased, and the thermometer I have used.

The island St. Lewis, otherwise called Senegal, is situated in 16° North latitude, and 16° West longitude. It is separated from the island of Soar on the East by the main river, which, on account of the smallness of the creek by which it is formed, is esteemed a part of the continent. It has the Atlantic Ocean on the West, from which it is separated by a small neck of land, or more properly sand, called Barbary Point. This neck of land is in several places not above five or six hundred yards broad. A branch of the river runs between it and the island itself, communicating with the main river above and below the island. It is about a mile in length, seven hundred feet in breadth, and contains five or six thousand black inhabitants. In the months of August, September, and October, it is usually about two or three feet above the level of the river at high water; but there are years in which the whole island is overflowed; in the other months

months of the year it may be about five or six feet above its level in the highest places. The continent and islands near it are as low, and in many places much lower, being overflowed for the most part during the rainy months; the latter are formed by creeks communicating with the main river, and thickly beset with mangroves. The water of the river is fresh during the rains, but very thick and troubled, the current being so rapid and strong as to stop the flood-tide; but in the dry months the river water is salt, and no other is to be had, but such as is procured by digging a pit into the sand more or less deep according to the height of the ground, into which the water filtrates from all sides, and gathers up to the level of the river. This water is brackish, but as no better is to be had thereabouts, the garrison, as well as the inhabitants, make use of it, except when the river is fresh.

The year is commonly divided by the Europeans as well as the inhabitants into two seasons; *viz.* the rainy and dry; by others called sickly and healthy season. The rainy or sickly one generally begins about the middle of July, and ends about the middle of October; during this time the wind is generally between the
points

points of East and South, the quarter from which the tornados come. It has been observed, that this season is more or less unwholesome in proportion to the greater or lesser quantity of rain that falls. A tornado is preceded by a disagreeable closeness and weight in the air, (which seems to be much hotter than the thermometer shows it to be); and it is known to come on by the rising of the clouds to the South-east, which by joining grow darker, so as to make the horizon look quite black, accompanied with lightning and thunder at a distance. The breeze dies away by degrees as the tornado advances, and an entire calm succeeds; the air grows yet darker; animals and birds retire and shelter themselves; every thing is silent, and the aspect of the sky, from whence the tornado approaches, is most dreadful. A violent storm comes on all at once, which is so cold as to occasion the thermometer to fall seven or eight degrees in a few minutes, and strong enough to overset negro huts and vessels, or drive the latter from their anchors, and throw them on shore. The storm abates, and heavy rain follows, accompanied with much lightning and strong claps of thunder. Sometimes tornados happen without rain, or at least with very little, but then

then the storm is more violent and lasts longer. It has been imagined by some, that this kind of storm brings some pestiferous quality with it, because they had observed, that out of a number of people several fell sick in one night after a tornado.

This I have in some degree experienced myself; for in the month of September, 1776, feeling myself very well, and having dined as usual, the storm of a tornado suddenly tore down the window-shutters, and blew into the room where I was: about an hour after I had rigors, and in the evening I had a high fever, which turned out to be a very severe bilious one; but notwithstanding this, it has, in my opinion, no such ill quality, and the above phænomenon may be attributed to the change it produces on the air, and of consequence on the body; it may therefore be considered as the occasional cause of a disorder to which the body was predisposed long before.

The dampness of the atmosphere during this season is so great that it is more or less perceptible in every thing. Leather, wearing apparel, and books, grow mouldy. Polished metals grow rusty. Sea salt, sugar, and other saline

line substances, which were perfectly dry before, melt; and the meat of cattle killed in the evening is spoiled the next morning, so as not to be fit for use.

Calms are frequent and disagreeable on account of the musquetoës and other insects, which then quit their retreats from among the mangroves and marshes, and spread over the face of the country.

The dry or healthy season begins commonly about the middle of October, and lasts to the middle of July. It is called dry, because then it hardly ever rains, or at least but very seldom; and healthy in opposition to the sickly one; for though pleurifies and peripneumonies will happen in the months of December and January, and fluxes in the months of April, May, and June, few people die, which, when compared with the numbers that die in the other season, justifies the denomination. When the rains cease, the wind shifts it quarter, and is for the most part East or North-east in the morning; but as the Sun rises on the horizon, the wind changes more and more towards the North, till about noon, sooner or later, it gets to the West of North, which is
called

called sea-breeze, and is very refreshing, though it happens sometimes, that as the Sun falls again on the horizon, the wind will shift again towards the East, and continue there all night. This wind blows sometimes very strong, and is always excessively hot, drying up the lakes and pools, which had been formed by the heavy rains and the overflowing of the river, and producing in such as partake of sea water, a fine sea salt in large crystals, not unlike fossil salt. In the months of February, March, April, May, and June, the wind blows almost constantly from between North and West, called sea-breeze, except now and then a day or two it will be East, which, when it happens in April, makes it excessively hot, the Sun being then in and about the zenith of Senegal, heating the vast plains of sand over which this wind is to pass before its arrival there, which, reverberating the received heat, may contribute to increase it; for I have observed, that this wind in the same month in the river Gambia was not hotter than any other wind, owing in all appearance to the difference of the soil of the country, which is not sandy like that of Senegal. I think it is the dust of the sand raised by this wind, which makes the atmosphere look hazy. I myself

saw in the year 1775, in the month of April, in a morning preceded by an Easterly wind, such a dust imitating a fog in the air, that one could not see above twenty yards.

The weather grew calm, and about eleven o'clock in the forenoon the atmosphere grew clear by depositing a brownish impalpable dust, which covered every thing near a line in thickness. The same thing I observed at sea from on board of a vessel in the month of March, 1775, at the distance of about five or six leagues from the land near the latitude of Senegal. The wind having blown East in the night, I found in the morning the sails, shrouds, and deck, covered with an impalpable dust. The description given by the learned Dr. LIND * of the Harmattans of the coast of Guinea, seems to agree with the East wind at Senegal in almost every respect, except that the damp vapour in the former is not perceptible in this, for it dries every thing that will admit of it. Water poured on the floor of a room for the purpose of cooling the air, is dried up in an instant, and there is some effect on the thermometer placed in such a room. Salt, sugar,

* Essay on the most effectual Means of preserving the Health of Seamen.

and the like substances, which are half melted by the damp air during the rainy season, dry again in a few days into hard lumps. Such household furniture as is made of wood, though it has been ever so well seasoned, shrinks and grows loose where joined, or splits and cracks where glued. It dries and parches the skin of the white people as well as the blacks, and makes it sometimes as rough as any clear frosty weather in Europe would. The sky is commonly clear and without clouds; but the atmosphere is hazy, which, in my opinion, as I have already observed, is occasioned by the dust, perhaps in conjunction with vapours arising from the surface of the earth and waters. These vapours, though not to be seen in the open air, I have perceived by their shadow upon white walls, arising from pools which were close to them; but the air being so dry they are absorbed by it, and no more perceptible as vapour. That the evaporation must be very great when this wind blows, the method the blacks have of cooling water will evince. They fill tanned leather bags with it, and hang them up in the Sun; the water oozes more or less through the leather, so as to keep the outward surface of it wet, which, by its quick and continued evaporation, occasions

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sions the water within the bag to grow considerably cool.

This wind is in general not reckoned unwholesome, either by the inhabitants or Europeans, though it feels very disagreeable, and by depriving the body of its thinner fluids may be looked upon as the immediate cause of some diseases, and the pre-disposing one to others. When it sets in sooner or later in the month of October, it is considered by the inhabitants as producing a cessation of the sickly weather, and the beginning of healthier. In the months of December and January, when the Sun is at its greatest distance, it makes the weather feel very cold in the nights and mornings.

The putrid disorder, which proved so fatal to the garrison and the inhabitants of Senegal, made its appearance in the beginning of August. The preceding month of July had been remarkably healthy; though the weather was very hot and sultry, there were only three soldiers in the hospital for slight venereal disorders; but we learnt by some black messengers, who came from Goree, that there was a fever raging there, which had carried off numbers of the French garrison and inhabitants of
the

the island, and we thought ourselves very happy not to partake of their fate. On the second of August one of the soldiers, who was in the hospital for a gonorrhea, being cured, was discharged. The fourth of August he was again reported to me as very sick in the barracks. I went to see and found him in a high fever with the worst symptoms. I ordered him to be carried to the hospital, where he died the third day, with all the symptoms of the greatest putridity. The orderly man of the hospital was seized on the sixth of August with the same disease, and died the ninth. One of the venereal patients, who remained still in the hospital, was taken with the same fever, and died a few days after. Some of the soldiers of the fort, having access to the hospital to visit their sick comrades, took the contagion, and spread it through the whole garrison. I am apt to believe, that the disorder was brought to Senegal by the black messengers from Goree; for I understood that one of them had died soon after his arrival in Senegal, and it may be, that the soldier who died first of it got the infection from them; for it is probable, that being discharged the hospital on the second of August, and having leave to take a walk on the island on the third, he had been in company

pany with some of these black messengers, or in the huts where they resorted, for the sake of hearing some news from Goree, where he was acquainted. It may perhaps be observed, that the soldier taking the contagion on the third of August, it could not make so rapid a progress as to manifest itself the next morning in the highest degree; but this I intend to support by the following cases. One of the surgeon's mates dressed a blister on the back of a soldier, ill of the disorder, with a digestive softened with oil of turpentine: having done, he came into the surgery, and looked quite pale, telling me, That the soldier's back had smelled so putrid and offensive, that it had made him quite faint and sick at the stomach. He took some tincture of bark and bitters, and went home, when a fever, with a train of the worst symptoms, made its appearance in the evening, and he died the third day. Another gentleman, who was sent for by the said surgeon's mate in the morning of the second day of his illness, and requested to draw up a will for him, arrived while I was present. He spoke with the patient for a few minutes, and then took me aside, saying, That there was a certain smell about the room, which made him faint and sick at the stomach, and that he should be obliged to retire; he did, but in the evening

evening was seized with the fever and all its bad symptoms, went through several of its stages, but recovered. A black boy, who had been waiting on the said surgeon's mate during his illness, was taken with the same disorder, and died of it in a few days. I could produce several other cases to strengthen what I have advanced concerning the quick appearance of the disorder itself after the contagion had taken place, but I think the three related ones sufficient.

The cessation of this contagious disease may be dated from about the middle of September. Governor CLARKE, who died the 18th of this month, concluded the dreadful scene. He had avoided the communication with all sick people, but did not hesitate in admitting my company. I was the only one who dined with him for several weeks ; and as I was continually among the sick in the hospital, and on the island (of the former of which I gave him a return every morning), I might probably have conveyed the infection to him in my cloathing, though I was not affected myself. A few people died in the months of October, November, and December ; some of relapses of the same fever, and others of severe fluxes and abscesses in the
liver,

liver, in which the disorder had terminated. It is remarkable, that a fleet of merchant-men, under convoy of a sloop of war, which left Senegal on the fourth of August, and sailed for England, had, by what I could learn, been entirely free from this disorder; neither did it reach as far as the river Gambia, for the garrison at fort James in that river enjoyed a pretty good state of health during all this time, and lost only two men, who died of fluxes.

The thermometer I have used is FAHRENHEIT's, made by WILLCOX and COYSGARNE. It has been compared, since my arrival in England, with one made by RAMSDEN, and found to be about three-fourths of a degree lower. It was placed in the fort at Senegal, in a room two stories high with a plank ceiling, and above that a bevil roof covered with slate: this room was not exposed to the Sun but at its rising and setting, it being sheltered from it by other buildings, when high on the horizon. I am sorry that I had not begun to keep the journal of heat and weather two or three months sooner, for the satisfaction of the curious in natural philosophy; but as it required a degree of leisure which I had not, being obliged
to

to attend to my duty, and as I observed nothing extraordinary either in the heat or weather, and imagined that journals of this kind, and of this country, might have been published in Europe long before now, I neglected it, but was tempted to keep it when the fatal disease made its appearance.

It has been observed by Dr. LIND, * that in that country a great change in the weather has little or no effect on the barometer. I have remarked the same at Fort James in Gambia, in the year 1776; for I found, from the fourth of February to the last of April, that the alteration the weather produced on the barometer was so little as hardly to be perceptible. The equality of the weather during this time (which is part of the dry season in which the sky is always clear and without clouds, though the different winds produce sensible changes in the atmosphere) may perhaps account for it; but Governor CLARKE, who had a barometer placed in one of his rooms in the fort at Senegal, told me, That the greatest changes in the

* Essay on Diseases incidental to Europeans in hot Climates.

weather, during the rainy season, had so little effect on that instrument, that it was hardly worth notice.

I beg you would do me the honour to present these remarks, with the annexed journal, to the Royal Society, if you find them to contain any thing worthy the notice of that illustrious body.

I have the honour to be, &c.

1778	hour.	Ther.	Winds	Weather.	
Aug. 10	11	82	NNW	Clear.	
	2	83	NNW	{ A tornado coming on, which lasted an hour.	
	4	81	NNW	Lightning to the Southward	
	8	81	NNW	Lightn. and thun. to the Southw.	
	11	6	80	N	Clear.
	9	81	N	Clear.	
	4	83	W	Lightn. and thunder with rain.	
	8	81	W	Clear with lightning.	
	12	6	76	NNE	{ Thunder, lightning and rain during the whole night.
	11	80	S	Clear.	
	3	82	N	Clear.	
	8	82		Calm and clear.	
	13	7	80	SE	Small rain.
	11	82	SSW	Cloudy with sun-sh. close and moist	
	4	83	W	Clear.	
	9	81	W		
	14	7	80	W	Cloudy with small rain.
	11	82	W	Cloudy.	
	4	83	W	Cloudy.	
	9	82	W	Cloudy.	
15	7	80	NNW	Cloudy.	
	5	83	W	Cloudy.	
	9	81	W	Cloudy.	
16	7	80	SW	Clear.	
	11	82	NW	Clear.	
	3	83	NW	Clear.	
	9	82	N	Clear.	
17	7	79	S	Cloudy.	
	10	80	W	Cloudy.	
18	7	80	S	Cloudy.	
	12	82	NE	Thunder and rain	
	2	78	W	Thick and misty.	
	8	79	WSW	Hazy.	
19	7	78	ESE	Clear.	
	11	81	S	Clear.	
	4	84	NW	Cloudy with Sun-shine.	
	9	82		Calm and Clear.	
20	7	79	S	Cloudy.	
	4	84	W	Cloudy and Thunder.	

1778	hour.	Ther.	Winds	Weather.
Aug. 20	9	82	W	Cloudy and rain.
21	7	79	SSE	A great deal of rain.
	1	78	SW	Cloudy and hazy.
	4	78	SW	Cloudy and hazy.
	7	80	S	Cloudy and showers of rain.
22	6	78	SW	A great deal of rain.
23	7	78	—	{ Calm and clear, a great deal of rain the night before.
	2	81	SW	Cloudy.
	9	80	NW	Clear, lightning to the Eastward.
24	7	79	N	Cloudy.
	12	82	NNW	Clear.
	2	82	—	{ Thunder, a tornado coming on from the East.
	9	81	—	{ Calm and cloudy, a tornado with rain three hours before.
25	7	78	—	{ Calm, a heavy tornado with rain last night.
	1	81	N	Cloudy.
	4	81 $\frac{1}{2}$	N	Cloudy.
	10	81	N	Clear.
26	7	80	N	Clear.
	11	80	E	{ Clear, a tornado with rain two hours before.
	1	81	—	Calm and clear.
	11	82	N	Clear.
27	7	78	E	{ Mifty, a great deal of rain the night before.
	11	78	SE	Cloudy, now and then rain.
	3	80	SE	Cloudy.
28	7	78	SW	Mifty and drizzling rain.
	2	82	SW	Cloudy.
	6	81	SW	Cloudy.
	9	80	W	Cloudy.
29	7	80	W	Cloudy.
	1	81	NW	Cloudy, blowing hard.
30	7	80	NW	Cloudy, the air very thick.
	10	82	SE	Thick and hazy.
	2	83	WSW	Hazy.
	8	82	W	Hazy.

1778	hour.	Ther.	Winds	Weather.	
Aug. 31	7	78	NE	{ Thick and rain ; a tornado last night, with a deal of rain, thunder, and lightning, before the tornado came on it was excessively close.	
	3	83	E		Cloudy.
	9	83	—		{ Calm, cloudy, and very close ; lightn. all round the horizon.
Sept. 1	7	80	W	Cloudy.	
	3	83	WSW	Clear.	
	9	82	W	Clear and fine.	
	2	7	81	SW	Close and cloudy.
		1	83	W	Hazy.
		5	84	NW	Thunder towards the South-east.
	9	84	NW	Lightn. towards the South-east.	
	3	7	81	SE	{ Close and cloudy ; last night calm and very close.
		11	84	E	Clear.
		5	85	SW	Cloudy.
	9	82	W	Cloudy.	
	4	7	80	W	Cloudy.
		11	80	W	Showers of rain, with thunder.
		9	81	NW	Cloudy.
	5	7	80	NW	Cloudy.
		12	83	NW	Cloudy.
		9	82	NW	Cloudy.
	6	7	81	—	Calm and cloudy.
		2	84	W	Cloudy.
		4	84	SE	A tornado with rain.
		9	82	—	Calm and hazy.
7		7	81	SW	Cloudy.
	1	82	SW	Cloudy.	
	5	84	—	{ Calm and close, a tornado coming on from the S. E.	
8	9	80	SW	{ The tornado ceased, cloudy and damp.	
	6	78	S	Cloudy.	
	12	83	S	Hazy and cloudy.	
	9	82	NW	Hazy and cloudy.	
	9	7	82	SE	Cloudy and close.
		11	83	SW	Cloudy.

1778	hour.	Ther.	Winds	Weather.
Sept. 9	6	84	W	Hazy and close.
	9	83	W	Cloudy.
10	7	82	SE	Cloudy.
	3	83	W	Cloudy.
11	5	85	NW	Clear.
	7	82	NW	Cloudy.
12	5	83	N	Cloudy.
	9	82	N	Cloudy.
13	6	80	N	Cloudy.
	12	82	N	Cloudy.
14	5	83	NW	Cloudy.
	9	82	NW	Cloudy.
15	6	80	N	Cloudy.
	3	83	N	Cloudy.
16	5	83	N	Cloudy.
	9	81	NW	Cloudy.
17	7	81	SE	{ Cloudy and thick, last night very close.
	12	83	SW	Cloudy and hazy.
18	2	83	SW	{ A tornado coming on from the East.
	9	79	—	{ Calm, from three o'clock till now heavy rain.
19	7	79	SE	
	11	82	S	Cloudy and rain now and then.
20	5	82	W	Cloudy and rain now and then.
	9	82	W	{ Close and cloudy, lightning to wards the East.
21	6	81	E	Cloudy, the night very close.
	10	76	N	{ Two hours before a tornado from the East, with a deal of wind and cold rain.
22	2	82	S	Cloudy.
	9	81	—	Calm, cloudy and close.
23	7	81	VNW	{ Clear, last night excessive close, and millions of musquetoos.
	12	83	NW	Clear.
24	5	84	NW	Clear.
	9	82	NW	Clear.
25	7	82	—	Calm, the night before very close.

1778	hour.	Ther.	Winds	Weather.
Sept. 19	10	84	—	{ Calm, a tornado coming on from the Eastward.
	1	81	E	{ Clear, two hours ago a tornado, with but little rain.
	5	84	NW	Clear.
	8	84	—	{ Calm and clear, the air filled with musketos.
20	7	81	N	Clear, the night before quite calm.
	1	84	WNW	Clear.
	9	84	W	Lightning to the Eastward.
21	7	81	E	{ Cloudy, last night a tornado with a great deal of wind, but not much rain.
	2	84	E	Cloudy.
	5	85	E	Cloudy.
	9	84	E	
22	8	79	E	Cloudy.
	1	85	—	Calm and clear.
	5	85	W	A tornado from the East;
23	11	84	NW	Clear.
	3	84	NW	Clear.
	9	83	NW	Clear.
24	7	82	S	Cloudy.
	10	84	SW	Hazy.
	3	87	—	Calm and clear.
	9	85	NNW	Clear.
25	7	82	E	{ Hazy and thick; at three o'clock this morning a heavy tornado, with a great deal of rain, thunder and lightning.
	11	84	E	Hazy and thick.
	2	87	SE	Hazy.
	5	88	SE	Hazy.
	9	84	NW	Clear.
26	5	—	—	{ A tornado from the East, with a great deal of rain.
	8	79	E	Clear.
	4	84	—	Calm.
	8	84	—	Calm, plenty of musketos.
27	9	84	N	Clear.

1778	hour.	Ther.	Winds.	Weather.
Sept. 27	2	85	N	Hazy.
	4	84	N	Hazy.
	8	84	N	Hazy.
	28	6	83	Calm and hazy.
	1	85	SW	Hazy.
	5	86	—	Calm and hazy.
	8	84	W	Hazy.
	29	7	82	W
	1	85	NW	Hazy.
	9	84	N	Clear.
30	7	82	N	Clear.
	1	84	NNW	Clear.
	5	85	NNW	Clear.
	9	84	NNW	Clear.
Oct. 1.	8	81	N	Clear.
	1	84	N	Clear.
	9	83	N	Clear.
	2	6	N	Clear.
	11	83	NNW	Clear.
	9	83	—	Calm and hazy.
	3	8	80	E
	12	80	E	Cloudy and hazy.
	9	81	E	Hazy.
	4	6	76	SE
	1	81	SE	{ Cloudy, a few drops of rain now and then.
	9	81	—	Calm and cloudy.
	5	6	79	—
	1	82	W	Calm and clear.
	9	82	W	Calm and clear.
	6	6	79	WSW
	11	77	SE	{ Cloudy, an hour before a tor- nado with rain and thunder.
	2	77	W	{ Cloudy, three hours before a tornado with cold rain.
	9	79	N	Cloudy.
	7	6	76	N
	1	80	N	Clear.
	5	81	N	Clear.
	9	81	N	Clear.
	8	7	80	N
				Clear.

1778	hour.	Ther.	Winds	Weather.
Oct. 8	10	82	N	Clear.
	5	84	N	Clear.
9	9	83	N	Clear.
	7	81	N	Clear.
	11	85	N	Clear.
	12	87	NNE	Clear.
	9	83	N	Clear.
10	7	80	W	Cloudy.
	11	82	W	Cloudy.
	1	83	SW	Cloudy.
	9	82	N	Cloudy.
11	6	80	—	Calm and cloudy.
	11	82	N	Clear.
	2	84	N	Clear.
	9	83	N	Clear.
12	6	80	NNE	Cloudy.
	12	82	NNW	Cloudy.
	9	82	N	Clear.
13	6	79	N	Clear.
	2	82	N	Clear.
	9	82	N	Clear.
14	6	79	N	Clear.
	10	80	N	Clear.
	4	81	N	Clear.
15	6	77	N	Clear.
	2	81	N	Clear.
	9	80	NNW	Clear.
16	6	78	N	Hazy.
	12	79	N	Clear.
	5	82	W	Clear.
	9	81	W	Clear.
17	6	79	W	Hazy, a heavy dew last night.
	12	82	—	Calm and hazy.
	9	81	W	Hazy, a dew.
18	6	79	W	Clear.
	12	82	W	Clear.
	6	83	W	Clear.
	9	83	W	Clear.
19	6	78	NNW	Clear.
	2	82	WNW	Clear.
	9	80	NW	Clear.

1778	hour.	Ther.	Winds	Weather.
Oct. 20	7	78	N	Clear, a heavy dew last night.
	2	82	NNW	Clear.
21	9	80	N	Clear.
	6	78	N	Clear.
	2	82	NNW	Clear.
22	9	80	NW	—
	7	79	NW	—
	1	81	N	Heavy dew last night.
23	8	80	N	Clear.
	6	76	N	Clear.
	11	82	NE	—
24	9	81	W	Dew.
	6	78	NW	—
	2	86	NE	Dusty.
	3	88	E	Dusty.
	4	90	NE	Dusty.
	5	92	E	Dusty.
25	8	87	E	—
	7	81	N	Clear.
	11	86	E	Dusty.
	3	82	E	Dusty.
	4	92	E	Dusty.
	9	83	N	—
26	8	77	NE	—
	4	85	N	Clear.
	9	81	N	Clear.
27	6	79	N	Clear.
	2	87	N	Clear.
	9	84	N	Clear.
28	6	79	E	—
29	6	78	N	Clear.
	11	84	NE	Dusty.
	1	90	NE	Dusty.
	2	92	NE	Dusty.
	9	83	NNW	—
	6	78	N	Clear.
30	12	86	NE	Dusty.
	9	83	NW	—
31	8	81	W	Hazy.
	11	82	W	Hazy.
	4	84	NW	Hazy.

1778	hour.	Ther.	Winds	Weather.
Oct. 31	9	85	—	Calm.
Nov. 1	6	80	NNE	—
	1	84	NNW	Cloudy.
	5	83	N	Thunder and rain.
	9	83	N	Cloudy.
2	7	80	N	Hazy.
	1	90	NE	Dusty.
	4	91	ENE	Dusty.
	9	87	NNW	—
3	7	80	NNE	Dusty.
	12	90	NNE	Dusty.
	4	92	NNE	Dusty.
	9	85	NNW	—
4	7	80	—	Calm.
	11	82	NNW	Clear.
	5	83	NNW	Clear.
	9	82	NNW	Clear.
5	7	78	NNW	Clear.
	11	85	N by E	Clear.
	1	80	NNW	Clear.
	9	81	NNW	—
6	6	77	NW	Clear.
	3	82	NNW	Clear.
	9	80	NW	Clear.
7	6	78	NNW	Clear.
	11	79	NNW	Clear.
	9	80	NW	Clear.
8	7	79	SW	Thick and cloudy, dew last night.
	11	84	W	Hazy.
	9	80	W	Hazy.
9	7	80	—	Calm.
	1	89	NE	Dusty.
	4	91	NE	Dusty.
	9	84	N	—
10	7	78	NNE	—
	11	85	NE	Dusty.
	4	91	NE	Dusty.
	9	83	NNW	—
11	6	76	NE	—
	2	91	E	Dusty.
	5	89	N	—

1778	hour.	Ther.	Winds	Weather.
Nov. 11	9	82	E	Calm. Note, that from this date forward the sky and atmosphere have been always clear, when the wind blew from between North and West; but when it blew from between North and East, the atmosphere was more or less hazy and the sky clear, except on those days where there are particular remarks.
12	7	76	—	
	2	89	E	
	3	92	E	
	9	83	NNE	
13	7	78	E	
	2	90	E	
	9	84	NNE	
14	6	76	ENE	
	2	90	NNE	
	9	83	NNE	
15	7	75	NE	
	4	87	NNE	
	9	82	NNE	
16	6	75	NNE	
	1	86	N by E	
	3	90	NNE	
	9	81	N by E	
17	7	75	NNW	
	11	81	N by E	
	4	82	NNW	
	9	80	NNW	
18	6	75	NNW	
	1	79	NNW	
	2	82	NNW	
19	6	74	NNW	
	12	79	NNW	
	2	79	NW	
	9	76	NNW	
20	7	74	NNW	
	11	76	NNW	
	9	78	NW	
21	7	73	NNW	
	1	85	NNE	
	3	88	NNE	
	9	79	NNW	
22	6	73	NNE	
	1	84	E	
	2	84	NW	
	9	78	NNW	
23	6	73	NNE	

1778	hour.	Ther.	Winds.	Weather.
Nov. 23	1	84	E	
	2	84	NW	
	9	78	NNW	
	24 6	70	E	
	4	81	NE	
	5	79	NNE	
	9	78	NNE	
	25 6	69	ENE	
	12	74	E	
	5	76	E	
	9	74	NE	
	26 6	63	E	
27	4	75	E	
	9	72	E	
	6	64	E	
	12	74	E	
	6	74	NNE	
	9	72	NNE	
	28 6	64	E	
	1	75	E	
	9	74	E	
	29 6	64	E	
	11	72	E	
	4	77	N by E	
30	9	72	NNE	
	6	64	E	
	1	75	E	
	9	73	NNW	
	6	64	E	
	11	72	E	
	2	80	E	
	9	73	N	
	2 6	64	E	
	1	79	E	
	4	77	NNW	
	9	73	NNW	
Dec. 1.	3 6	64	E	
	11	76	E	
	1	79	E	
	9	75	NNW	
	4 6	65	NE	

1778	hour.	Ther.	Winds	Weather:
Dec. 4	1	78	E	
	9	74	NNW	
	5	6	67	NE
5	2	77	E	
	5	76	NNW	
	6	6	68	NE
6	1	74	NNW	
	4	73	NNW	
	7	6	68	NNE
8	7	7	70	NE
	1	76	NNE	
	9	73	N	
9	7	70	NNE	
	12	72	NNE	
	2	76	NNE	
10	9	72	NE	
	6	66	E	
	11	76	E	
11	1	80	NE	
	7	68	E	
	1	79	E	
12	2	80	NNW	
	9	74	NNW	
	7	65	NE	
13	11	70	E	
	4	80	E	
	9	73	N	
14	7	66	NNE	
	11	76	E	
	3	80	E	
15	9	74	NNW	
	7	67	E	
	11	76	E	
16	3	83	E	
	9	76	N	
	7	71	E	
17	1	78	E	
	5	86	E	
	9	79	NNE	
18	7	71	E	
	1	81	E	

1778.	hour.	Ther.	Winds	Weather.
Dec. 16	2	84	E	
	9	75	NNW	
17	7	69	NE	
	2	75	NE	
	4	78	N	
	9	72	N	
18	7	64	NE	
	2	84	E	
	4	79	N	
	9	73	N	
19	6	65	NE	
	1	80	E	
	9	75	NE	
20	6	62	NE	
	2	80	E	
	9	75	NNE	
21	6	64	NE	
	1	73	E	
	2	75	E	
	9	71	NNW	
22	6	64	NE	
	9	71	NNW	
23	6	64	E	
	12	78	E	
	2	81	NNE	
	9	73	NNW	
24	7	66	E	
	2	78	E	
	5	77	NNE	
	9	72	N	
25	7	63	NE	
	1	73	E	
	2	74	E	
	9	70	N	
26	7	58	NE	
	11	68	E	
	3	72	NNW	
	9	67	N	
27	7	60	NE	
	2	74	N	
	9	68	N	

1778	hour.	Ther.	Winds	Weather.	
Dec. 28	7	62	NE		
	12	73	E		
	2	72	NNW		
	9	70	NNW		
	29	6	70	E	Foggy and thick, drizzling rain.
	7	70	N	Small rain.	
	11	72	E		
	1	75	E		
	9	72	N	A few drops of rain.	
	30	6	67	N	{ Thick and foggy, with a few drops of rain.
	12	71	NNW	Thick and foggy.	
	4	73	N	Foggy.	
	9	70	N		
1779					
Jan. 1	7	64	NE		
	1	76	E		
	4	80	NNW		
	9	72	NNW		
	2	7	63	E	
	11	68	NNW		
	3	71	NNW		
	9	69	NNW		
	3	6	64	NNW	
	11	70	NNE		
	3	70	NNW		
	9	69	NNW		
	4	6	63	N	
	12	73	E		
	9	70	NNW		
	5	6	60	N	
	9	69	NNW		
	6	6	63	N	
	11	70	NNW		
	4	72	NNW		
	9	70	NNW		
	7	6	62	N	Foggy.
	2	71	NNW		
	9	70	NNW		
	8	7	67	NE	{ Cloudy and thick, lightning and rain last night.

1779	hour.	Ther.	Winds	Weather.
Jan. 8	4	70	NNW	Foggy.
	9	69	NNW	
	7	67	N	
9	4	70	N	
	9	70	N	
	7	67	N	
10	7	67	N	
11	7	69	N	
	1	70	NNW	
	4	71	NNW	
	9	69	NNW	Dew last night.
	7	67	N	
	2	70	NNW	
12	4	70	NNW	
	9	69	NNW	
	7	68	N	
13	2	70	NNW	
	4	71	NNW	
	9	69	NNW	
14	8	68	N	Dew last night.
	1	69	NNW	
	4	69	NNW	
	9	68	NW	Dew last night
	9	68	NNW	
	11	69	NNW	
15	4	70	NNW	
	9	69	NNW	
16	7	67	N	Heavy dew last night.
	11	68	NNW	
	4	69	NNW	
	9	69	NNW	
	7	67	N	
17	1	68	NNW	
	4	69	NNW	
	9	68	NNW	
18	7	66	NE	
	12	70	NE	
	4	73	NE	
	9	71	NE	
	7	63	NE	
19	11	68	NE	
	4	72	NE	

1779	hour.	Ther.	Winds	Weather.
Jan. 19	9	69	N	
20	7	59	NE	
	11	70	NE	
	4	75	NE	
	9	67	NE	
21	7	60	N by E	
	1	73	NE	
	4	75	NE	
	9	67	NE	
22	6	58	NE	
	12	70	NE	
	4	75	NE	
	9	67	NE	
23	6	58	NE	
	12	69	NE	
	2	71	NE	
	9	67	NE	
24	6	59	NE	
25	6	55	N by E	
	12	67	NE	
	4	70	NE	
	9	65	NE	
26	6	56	NE	
28	6	55	NE	
	11	66	NE	

P R E F A C E.

THE disease, which is the subject of the following sheets, does not happen annually at Senegal, but only in those years, when the rains are extraordinarily frequent, heavy, and of a long continuance. The common diseases of the country, during moderate rainy seasons, are intermitting and remitting bilious fevers, and fluxes. The first of these generally yield to antimonials and bark, and are not very fatal; but the latter are very stubborn, and, if they are not overcome in the beginning, they generally carry off the patients.

In proportion as the rains are heavier and more frequent, those diseases are more malignant, and fatal. During the first rainy season, that I resided there, viz. in

the year 1775, when the rains were pretty heavy and frequent, many were seized with the bilious fever, which in some few was attended with very bad symptoms, and might be called, from the yellow colour, which it induced on the skin, yellow fever. The next year, viz. 1776, we had but a few showers of rain, and they fell at intervals of many days; for which reason the season was remarkably favourable, and passed over without occasioning any mortality. In the year 1777 the rains were not quite so heavy as in the year 1775, and, therefore, the fevers were milder, but in the year 1778 the rains set in early, they were frequent and heavy, and continued for a long time; in consequence of which the island became partly overflowed, and the very dreadful disease, of which I am about to treat, made its appearance. Mr. WILLIAM BISHOPP, who was at this time at the head of the medical establishment in the province of Senegambia, and had been in the same capacity for many years past, had only seen it happen once before, viz. in the year 1766, when the rains were so heavy

heavy and frequent, as to occasion the overflowing of the whole island, and to oblige the Europeans to go in canoes from one house to another. He says, That it then raged with the same fury, and proved in proportion as fatal, as it did at this time.

With respect to the treatise itself, I think proper to observe, that being no admirer of those writers, who have no opinion of their own, but implicitly follow those of others, without exerting their own faculties, I have not adopted their method; but, unprejudiced by any particular system or doctrine, have taken the liberty of giving my own opinion in many instances, which I have endeavoured to support by arguments, partly founded on reason, and partly on experience. But I have given, at the same time, as true and full an account of the disease itself, and the circumstances attending it, as I was able; by which means the reader will be enabled either to adopt or reject, according to his
own

own judgment, any of those opinions, which I have advanced.

I must further take notice, that the indifferent knowledge, which I have of the English language, has prevented me from publishing this treatise sooner. I first wrote it in Latin, and had a mind to publish it in that language; but a medical friend of mine*, to whom I had given it for inspection, not only advised me against it, but persuaded me to translate it into English, and gave such reasons, as convinced me of the justness of his advice. I then undertook the task with diffidence, but went through it with more success, than I at first expected; yet I hope the reader will not be severe with regard to the style, but rather lay more stress on the matter, as a rarity from Africa, than on the manner, in which it is delivered.

* Doctor SCHWEDIAUER.

A
T R E A T I S E
O N T H E
SYNOCHUS AT R A B I L I O S A,

A contagious Fever, which raged at Senegal in the Year 1778, and proved fatal to the greatest Part of the Europeans, and to a Number of the Natives.

Accessu variant morbi: mox fulminis instar
Haud prævifa venit clades recteque valentes
Opprimit: hos morbos veloces dicere mos est.
————— Progressu dispare gaudent:

Aut etenim se perpetuo natura labori
Adstringit, tristem dum nulla remissio sensum
Sublevat et celeri versatur vortice fatum.

Hos *Synochos* vocitant, —————

HEBENSTREIT.

IN the month of July 1778, the garrison and the inhabitants on the island of Senegal were, for that time of the year, remarkably healthy, from which favourable circumstance I was induced to hope, that the approaching rainy season might pass over without causing much

much mortality. But my hopes were much frustrated, when on a sudden a most dreadful disease broke out, which, raging from the beginning of August to about the middle of September following, carried off the greatest part of the Europeans, and a great number of the native mulattoes and blacks. The Europeans suffered much more by it, in proportion, than the mulattoes, and those much more, than the blacks. It ceased to rage about the 18th. of September, and those, who had escaped its fury, were, as far as I know, not attacked with it after that day; but some of those, who had recovered, were seized with relapses during the following month, and some of them died as late as the month of November. Out of the number of ninety-two white people, which were on the island, when it broke out, thirty-three only were left, when the French invested the island on the 28th, of January, 1779, and eight of those were hardly able to walk. Three of the latter died on their passage to France, as prisoners of war; and in two more of them the probable fatality of lingering fluxes, in which the disease had terminated, was anticipated, by their being drowned on the bar at Senegal, from the oversetting of the boat, which carried them. The symptoms attending

attending the disease were so horrid and dreadful, that it seemed almost impossible that any one could have a chance of recovering ; and it was so very contagious, that it spread all over the island with an amazing rapidity. Most patients died on the fourth or fifth day ; a few were carried off suddenly on the third, and some others not before the sixth or seventh day. Out of so small a number of Europeans as ninety two, not less than four died on the 23d of August, four on the 26th, three on the 27th, five on the 5th of September, and there was hardly a day between the 9th of August, and the 18th of September, without one or two. Those who survived the seventh day, either recovered, or fell into lingering dysenteries, attended with obstructions in the liver, which sometimes terminated in suppuration, and of which death was sooner or later the consequence.

A constant and uninterrupted fever attended the disease, from the beginning to the end, in all those who died ; and in some who recovered, no apyrexia took place before the seventh day, or later ; in others sooner. This fever, therefore, having no intermission, and in most patients, as far as I have been able to observe, no remission, cannot but be called a continued.

nued one ; and when I shall have related the symptoms which attended it, and the effects which it produced, I have no doubt but every one will coincide with me, and will consider it also as malignant, from its very causes ; for which reason it could hardly be otherwise than fatal to those who were seized with it. For in the greater part of those, who were afflicted with it, it seemed not to be in the power of nature or medicines to remove the causes, from which it originated ; nor did it appear, that they both jointly were able to prevent its fatal effects.

To enumerate the symptoms, as they succeeded each other, will be a proper means to form a distinct and clear history of the disease. Following, therefore, this method, I shall relate them in their succession as nearly as possible.

Most of those, who were seized with the disease, felt, just before it made its attack, a *languor* and a giddiness of the head. This was soon followed by a *rigor*, which in some was but slight, and in most patients did not last longer than a quarter of an hour ; yet those, who were suddenly infected by contagion, felt no *languor*, but were soon attacked with *rigors*.

While

While this *rigor* lasted, the muscles of the whole body, but particularly those of the face, were slightly convulsed, not unlike a trembling or twitching; in some this slight convulsion did not take place in all the muscles at the same time, but affected them alternately. The face became pale and lurid. The lips and nails of the fingers turned livid. They all complained of a sickness and *nausea* at the stomach, and soon after threw up its contents, sometimes mixed with bile. Now the *rigor* subsided; the body became hot, and the face red. The pulse grew full and quick, but rather soft: in some, however, there were likewise signs of a *diathesis phlogistica*, and particularly of a peripneumony, attended with a hard pulse. The eyes were red and shining, and seemed to project from their orbits. Some were attacked with a very painful inflammation of the eyes a few days before they fell sick. In others this inflammation of the eyes took place the very day they were seized with the disease, and it lasted during the whole sickness. All those, who were afflicted with such an inflammation, died, excepting one, who likewise, though he recovered for a time, died afterwards of a relapse. Most patients complained of a great headach, and of a pain in their back, particularly about the region of the

loins, and sometimes in their arms and legs. They felt a most acute pain above and across their eyes, which often affected the sight. Notwithstanding the fullness of the pulse, there appeared in some a dejection and lowness of spirits, with a failure of strength; in others an anxiety, with deep fetched sighs, and most of them despaired of recovery. All complained of a load, pain and heat about the *Præcordia*, but particularly about the pit of the stomach. The vomiting of yellow bile now took place, and was often repeated. This gave no relief to the patient, nor did the retching cease, though the stomach was quite evacuated, but a convulsive motion took place, and continued the retching, though nothing was thrown up. This caused a great thirst, which could not be quenched by any kind of liquid; for whatever was drank, was immediately rejected. The respiration was very laborious, and the expired air felt very hot to the bystanders. Some few did not vomit, nor had hardly any sickness at the stomach; but these broke much wind upward and downward without any stools, and were also suddenly seized with strong convulsions, and entirely deprived of all senses, throwing up in the mean time great quantities of a black mat-

ter, which resembled the grounds of coffee, but was commonly coagulated in small lumps; the first convulsive fit abating a little, another took place, and they died within a few hours, without recovering their senses. But of this I shall have occasion to speak hereafter, and, therefore, will now resume the thread of the general symptoms. The skin was, in most patients, at first dry and felt very hot to the touch. In some it remained in this state for some days, but in others profuse sweats soon broke out, although the fever did not apparently abate. The urine was high coloured, sharp, and small in quantity. Some complained of a strangury, or a difficulty of making water, though they had no blisters applied to their bodies. Notwithstanding the fatigue and weariness, of which they complained, they tossed themselves about, and could not sleep on account of the fever and vomiting. The tongue was but very little altered, though its borders were rather tumid and more red, than natural, and the middle part of it was in some a little whitish. The blood drawn out of a vein at this period did not much differ from sound blood, especially while warm, but when cold, the *crassamentum* was very small in proportion to the *serum*, and very loose and soft in its texture.

As

As the disease advanced, some of the above-mentioned symptoms abated, some grew worse, and others more dreadful acceded in some patients sooner, in others later. The tongue became furred, and changed its whitish colour in the middle for a yellow or brownish one, particularly towards the root, which might be partly owing to a tinge of the bile, continually thrown up. Though the pain of the head and back abated in some degree, in those who had any evacuations by stool, yet the weakness and dimness of the sight remained, to which deafness was often joined. The vomiting continued, and the bile, which was before thrown up of a yellow colour, and in a liquid state, was now changed both in colour and substance. It became green, brown, and at last black, and was coagulated in small lumps. A limpid fluid, not unlike *saliva*, was ejected at the same time, in which the lumps of coagulated bile floated. The bile did not communicate any colour to this liquid, nor did it dissolve in it, but like a greasy matter swam mostly on its surface.

The pulse was now not so full as before, but quicker; most patients complained of a burning heat within the pit of the stomach, attended

attended with an unquenchable thirst. Some patients, in hopes of finding some relief against this internal heat and burning, stole from the beds, and laid down naked on the floor. Some were seized with a pain in their throat and a difficulty of swallowing, commonly attended with a redness on the outside. Those, who were afflicted with this symptom, died suddenly, and sooner than one would have expected from the other symptoms. A continual *Diarrhœa*, with gripings, now took place, by which a great quantity of black and putrid *fæces* were evacuated. A deal of liquid blood came away with the *fæces*, which seemed to issue forth from the hæmorrhoidal vessels. This *diarrhœa*, when it had lasted for a little time, underwent some change. A liquid, not unlike the *serum* of the blood, was then continually evacuated, and with it small coagulated lumps of a black matter, which resembled the black bile they had before vomited. It floated like this, in the liquid, with which it came away, and did not dissolve in it. When they made any urine, which was seldom the case, it was very high coloured. The skin was now mostly moist, and sometimes quite wet. The face became of a lurid colour. Some hawked up and spit blood, which seemed to me to come from the lungs,

lungs, and others had small and frequent bleedings at the nose, without any relief. All of them were in some degree delirious, but those, who had a dry skin, were most so. The *singultus*, which began soon after the vomiting, became more and more frequent; the pulse died away by degrees; a groaning took place, and death ensued.

Those, who survived the third or fourth day, were still afflicted with some new symptoms. The skin became now full of *petechiæ*; they made their first appearance about the eyelids, and on the wrists, and soon after on all the other parts of the body; but the breast was generally most beset with them. They were mostly of a florid red colour, but sometimes purple or livid; they appeared first like small points, and increased gradually into spots of about a line, or a line and a half in diameter, yet they were not circular, but irregular in their circumference.

Many patients were now seized with a *coma*; some of these were affected with *stertor*, and this in others was mixed with a groaning, interrupted with hiccups, tossing, at the same time, their arms about, and grinding their teeth.

teeth. Those laying in this condition, when they were awakened by a loud voice, or by shaking them, seemed to be much frightened, spoke a few raving words, and soon relapsed into the same state. The stools came away imperceptibly. The tongue was now much diminished in its volume; it being shrunk up, dry and black; neither were they able to put it out, when they were desired. The *singultus* became more and more frequent, and almost uninterrupted. *Vibices* also appeared in different parts of the body, but commonly in such, as had been squeezed or compressed by some means or other; wherefore, they mostly arose on that side or part, on which the sick lay. They appeared just a few minutes before death itself put an end to the horrid scene.

Having now given a general description of the symptoms, and the course of their succession to each other; as nearly as possible, I shall make a few more observations on the *delirium*, *petechiæ*; and other appearances, which could not be done before without interrupting the thread of their succession.

The *delirium* was generally rather mild than violent. Some of the soldiers in the hospital,

on being asked, how they found themselves, would answer, That they found themselves exceedingly well, and fit to do their duty ; in consequence of which some had dressed themselves, and wanted a discharge from the hospital, to go to the barracks, though they could not utter many words, without being interrupted by hickups ; but they were easily persuaded to stay in the hospital till the next day, which they seldom lived to see. One of those, who had this *delirium*, and also a difficulty of swallowing, accompanied with a large reddish spot on the left side of his neck, I met walking about the ward. I asked him, how he was ? he answered, That he should be very well, if it was not for the pain in his throat, and the purging he had upon him ; but this he could not say without being often interrupted with hickups. I felt his pulse, and found it very small and quick. I told him to go and lie down on his bed ; he obeyed, and threw himself on it upon his face, struggling with his arms and legs as if he could not get upon it. I perceived this at a distance, and went immediately up to his assistance with the orderly man and some blacks ; they turned him on his back, and I found, to my great surprize, that he was dead ; his face, the left side of the neck, and the same side of the
body,

body, looked blue, and turned black soon after. Many others, who were delirious, and at the same time afflicted with a *diarrhæa*, walked backwards and forwards to the ward to ease themselves just a few hours before they died; while others, who were comatose, were confined to their beds.

As there has been a difference of opinion among some physicians of great authority concerning the seat, the appearance and the names of *petechiæ*, I will give as clear a description of those, which attended our disease, as I am able, and then say a few words on the different names applied to them. They appeared at first like small points, as I have already said, and afterwards grew larger by degrees; they had their seat within the skin, and never rose, as eruptions do, above its surface; they were mostly of a florid red, when they first appeared, though in some they were purple or livid from the very beginning. Nothing like *petechiæ* appeared on the bodies of the blacks, and indeed if there had been any, they could not have been perceived on account of the opacity of their skin. They underwent a certain change in the colour of their skin, which put on more or less of a brownish cast, easier to be observed than de-

scribed ; but this change of colour may be compared in some measure to the paleness or ghastliness of white people, when they are sick. In the Mulattoes and their descendents the *petechiæ* appeared very plainly.

The *petechiæ* go by various other names ; some call them *punctula*, others *lenticulæ*, and others again call the disease, in which they are one of the symptoms, *morbus pulicaris*. The word *petechiæ* is not Latin, but Italian, signifying a small pox of a purple colour, * for which reason it does not seem to be a very proper term on the present occasion ; but I have preferred it to the others, because they seem to be as improper, and because it is now generally received and made use of, at least in England, to signify those spots which I mean. They might be called *punctula*, when they first appear, but afterwards they change into spots, and then it would be improper to call them *punctula*. They cannot with any propriety be called *lenticulæ* ; for it seems to be clear from the

* *Petechiæ*, *petechialis febris*, seu *pulicaris dicta*, est febris, qua cutis maculis, pulicum morsui similibus, variegatur, derivatur a voce Italica *pettechie*, significante variolas purpureas. Lexicon medicum STEPH. BLANCARDI.

writings of CELSUS, that they were pimples or blotches, rising above the skin, and not spots, which he has called *lenticulæ*. He compares the scales of the worst sort of *impetigo* with those of the *lenticulæ**; besides, the word itself carries with it an idea of size, which is not at all applicable to the *petechiæ*.

Some have called the disease, which is attended with *petechiæ*, *morbis* or *febris pulicaris*, because they thought they resembled fleabites. This may be the case, but it is only conditionally; a fresh fleabite is not at all like a *petechia*; for it causes in most people, when recently inflicted, a little whitish tumour, encircled with red, which rises above the skin. It has a puncture in the middle, which only is perceptible, when closely examined; this tumor subsides by degrees, and disappears: the second or third day a small yellow or brownish spot appears in its place, and this is not unlike a *petechia*. I have seen the poor people of

* Nam subalbidum est (scilicet impetigo) et recenti cicatrici simile, squamulasque habet pallidas, quasdam subalbidas, quasdam lenticulæ similes, quibus demptis, nonnunquam profluit sanguis. Lib. 5. cap. XXVIII. de impetiginis speciebus.

different countries marked with such spots, but our *petechiæ* were larger than any spots of this kind I ever have seen.

It might, perhaps, be asked, if our *petechiæ* were not occasioned by fleabites? To this I can readily answer, that there are hardly any fleas to be seen at Senegal in the rainy season, during which the disease raged, though they exist in such numbers, during the dry season of the year, that the sandy soil in some places is in a manner covered with them, but as soon as the rains set in, they disappear. But the insects called musquetoës, in hot countries, are an intolerable plague to the healthy as well as the sick people at this time of the year; yet their bites can not, in the least, be suspected as the cause of *petechiæ*, for they have not the smallest similitude with them; and as a proof that the *petechiæ* were not the consequence of the bites of musquetoës or any other flying insects, it is to be observed, that they appeared as frequently on the skin of opulent persons, whose beds were hung round with gauze curtains, by which those insects were prevented from having any access to them. Besides, I do not think it a very difficult matter for a
physician

physician of the least experience, to discern, whether the causes of *petechiæ* are internal or external ; and I think it still easier to distinguish them from the eruption in the miliary fever, with which, it seems, they have been sometimes confounded.*

The small bleedings at the nose, which happened to some patients, afforded no relief ; but profuse and repeated hemorrhages of this kind produced good effects. They happened in two patients only ; and as they seemed to be the cause of their recovery, I will relate their cases. The first, in whom such an hemorrhage seemed to be the means of recovery, was a soldier of a robust constitution. He was seized in the forenoon with the disease in the usual way. In the afternoon the fever was high, and he complained of a terrible headach. In the evening he bled plentifully from the nose, after which the fever abated, and its attendant symptoms became milder. The next morning he said, he had passed a pretty good night, but that the headach had now returned, and that he felt himself upon the whole much

* See Sir JOHN PRINGLE's answer to the learned professor de HAEN.

worse. He had much fever, and now and then an inclination to retch, which was again followed in the afternoon by an hemorrhage at the nose, with an abatement of the fever. In this manner the fever and nasal hemorrhage alternated daily, and diminished gradually, till at the end of five or six days they both ceased entirely, and the patient was soon after well enough to leave the hospital.

The other case, where the recovery of the patient seemed to be owing to a profuse hemorrhage from the nose, is as follows: A gentleman, who had been very ill of the disease, but had then been for about three weeks in a convalescent state, suddenly relapsed. He complained of an intolerable headach, which was soon after followed by a bleeding at the nose. I looked upon this as a good sign, and hoped that it would relieve him of the headach: But it continued too long, neither did the blood come out by drops, but it ran in a small stream. The patient frightened at this, and fearing that it would be the cause of his death, begged, that something might be done to stop it; for he was not in the least delirious. Just at this interval of time Mr. BISHOPP, surgeon in chief of the province, who had been sent for, came

came in, and seeing the great quantity of blood, the patient had already lost, apprehended that it would induce a debility, which might afterwards prove the cause of his death, if it was to flow much longer at this rate. I was much of the same opinion, and therefore it was thought proper to open a vein in his arm, to avert the *impetus* of the blood from the head*. For this purpose about six ounces of blood were drawn from the arm; but to no effect. Linen cloths dipped in vinegar and cold water were applied to his neck and temples. Small dossils of lint dipped in a styptic solution were introduced into his nostrils, and his feet were put into warm water; but all to no purpose. The blood continued to run in a small stream. The pulse became weak, and the patient fainted, upon which the bleeding ceased; but as soon as he came to himself, the blood began to flow again, and this was followed by a second *deliquium*. At last, however, the hemorrhage ceased; but whether it was effected by the repeated application of styptics in his nostrils,

* Avertitur quoque interdum sanguis, ubi alia parte prorumpens, alia emittitur. Desinit enim fluere, quæ volumus, inde objectis, quæ prohibeant, alio dato itinere. CÆLSUS, lib. 2. cap. x.

or if it was the work of nature, I do not know. The exhausted patient fell into a sound sleep; the fever did not return, and he recovered strength gradually through the use of bark with Rhenish wine.

If we reflect on the horrid symptoms attending the disease, in the order I have related them, it would almost seem impossible, that any one of the patients could have recovered. But it is to be observed, that all those symptoms did not accompany the disease in each individual patient; nor were those, which attended it, equally severe in every one of them, for which reason some got through it. But they were so very weak and emaciated, and remained so long in this state of debility, that they were much subject to relapses. They spit first, when the fever left them, a black *mucus*, which detached itself from the tongue and the *fauces*, and afterwards a quantity of liquid blood, which seemed to proceed from the gums, the root of the tongue, and the *faucis*. As they did not spit during their sleep in the night time, the blood, they brought up in the morning, when they rose, was mostly coagulated in lumps; but in the day time it was chiefly in a liquid state. The *petechie* became gradually

ally more and more pale, till they disappeared entirely. In some they were perceptible some time after they had begun to take an airing out of their rooms, and perhaps a fortnight after the fever had left them. Most valetudinarians had a looseness for some time, of which some got the better gradually; but in others, notwithstanding the utmost care was taken with respect to diet and medicines, it became worse. The fever returned. The stools became more frequent, black and bloody, attended with gripings and *tenesmus*. Some complained of a pain in the right *hypochondrium*, often attended with a hardness or a protuberant tumor. The *petechiæ* returned; other symptoms of putridity reappeared, and death ensued.

The pain and hardness in the right *hypochondrium* were mostly occasioned by the formation of an abscess in the liver. But the generality of the patients died before any matter was formed; or at least before any external tumor with a sufficient undulation appeared, to warrant the making an opening; for it is not improbable, that, before they died, matter might have been formed, but so deeply seated, that instead of protuberating on the convex side of the liver, it might have pointed towards its

concave side, and perhaps discharged itself into the cavity of the *abdomen*. In one case a tumor with undulation arose by degrees in the region of the liver, which was opened without success.

The person, to whom this happened, was a soldier about five and twenty years old, who some time before, while labouring under the disease, was among other bad symptoms afflicted with an obstinate and long-continued *singultus**, which having gradually ceased, he became better, and I had good hopes that he would recover, but they were frustrated. A dysentery stole slowly upon him, the fever returned, and he complained of a great pain in his right side about the region of the liver. Soon after the stools became bloody; the *singultus* recurred, and a tumor began to rise just below the short ribs on the right side, which, when pressed or handled, gave the patient much pain, but not the least inflammation appeared externally in the teguments of the *abdomen*. Instead of mercurial and gum plaisters, which

* The following sentence of CELSUS deserves a place here: *Frequens singultus et præter consuetudinem continuus jecur inflammatum esse significat.* Lib. 2. cap. vii.

had been applied before, poultices were now used, by which means it rose to about the size of a hen's egg. I now perceived the existence of matter, but still deeply seated, and punctured it with an abscess lancet. About a pint of matter ran out, which was of no uniform colour, but one half of it was black like coagulated blood, and the other half was yellow and slimy*. It smelled so putrid, that neither I, nor the orderly man of the hospital, who assisted me, could stand the stench of it, but were obliged to retire at a distance, and leave the patient to himself, until the first putrid *effluvia* had dispersed in the air. Every other patient in the same ward, who was able to crawl, quitted his bed and went into another ward. I afterwards dilated the puncture, and made an opening of about an inch in length. I introduced a probe, and found a large cavity with a deep *sinus* in the liver. By this time the patient was so weak, emaciated and excruciated with the flux, that he was continually intreating me to give him some composing draught, which would abate the pain and flux for a while. However the pain was not so violent

* Ex jecinore, si pus cruentum exit, mortiferum est.
 CELSUS, lib. 2. cap. viii.

after the opening; the wound was injected with barley water, honey, and tincture of myrrha; the flux abated, and he felt himself a little better. But soon after the wound took a bad appearance, its borders and edges turned livid and black, and when pressed in its circumference, it discharged a black, putrid and coagulated matter, mixed with a yellow *sanies*. The flux became worse, and the stools resembled the matter, which was discharged from the wound, in so much that it induced me to believe, there might be a communication from the abscess to the stomach or intestines: *Petechie* appeared on the skin. The contents of the whole *abdomen* seemed to be in a state of putridity, and the patient died.

Another single instance of abscesses; forming in the legs and arms of a patient, who just seemed to be passed the danger of dying, I think proper to relate, because it was the only one of the kind, that happened. The patient was a drummer, about sixteen years old, who during the disease, from which he had a narrow escape, was very full of *petechie*. The fever had left him, and he seemed to be in a state of recovery, but he complained of a pain in his legs, and was not able to stand. A few days

days after a swelling appeared in them, which was attended with a high fever and inflammation. They were fomented and poulticed. The swelling, of one leg in particular, increased much, and a few livid spots appeared on its skin. I perceived a fluctuating matter contained in its whole length, which pointed a few inches above the internal *malleolus*. I punctured it with a lancet, and let out about two pints of good *pus*, leaving, as I suppose, as much behind, with an intention to evacuate it gradually; but the patient soon after this became worse. Notwithstanding he had taken a great quantity of bark before, and was now taking it, the fever increased. He was seized with a terrible *diarrhœa*, attended with an unquenchable thirst. The stools were thin, and looked like clear yellow bile. He lost the use of his arms, and died the sixth day after the leg had been opened. The other leg was likewise much distended, but it was but slightly inflamed, neither did the matter point any where near the skin, for which reason, and the patients change for the worse after the former discharge, it was not opened. He had likewise an hemispherical tumour, about two inches in diameter, on each arm below the insertion of the deltoid muscle. They were formed

formed by the skin, which had detached itself from the muscles, and risen in this form above the surface of the arm. They were soft, and contained a fluctuating matter, but not attended with the least inflammation or alteration in the natural colour of the skin. Neither of them were opened.

I was induced to relate this case on account of its deviation from the common course of the disease, the thread of which I shall now resume, and make some general remarks.

The few, who recovered of the disease, and got the better of the looseness, with which they were afflicted some time after, were still very weak for a long time, and much subject to relapses of the same disease, of which (when again seized with it) they mostly died. But in this case they were not carried off so suddenly, as those, who died of the first attack. They seldom died before the eleventh day, and some not before the fourteenth. Neither were the symptoms so violent. They generally lay comatose, covered with *petechiæ*. They were not much troubled with vomiting and *singultus*, but had frequent black and fetid stools which commonly

monly went off insensibly some days before they died.

The *diagnosis* of the disease, so as to ascertain with exactitude the species to which it belongs, is difficult to be formed. In the beginning it is not to be distinguished from the fever, which is called *bilious*, or from that one, which goes by the name of *yellow fever*, but by the severity of its symptoms. For in those the symptoms are the same, but milder, and I am persuaded, that our disease only differs in malignity from those fevers, which I conceive to originate from the same causes, but proportionably less deleterious. In its progress it is not so difficult to be distinguished from them; for the bilious fever has generally intermissions, and the yellow one slight remissions; yet sometimes it happens, that the first of those continues in hot countries to the third day, before it intermits*, and that the latter has hardly any remissions on the first days. I also

* Febris biliosa rarius quidem apud nos ad eundem gradum accedit, ut inter continentales referri mereatur; in calidioribus vero regionibus gravior est, sæpius cum rejectione bilis per vomitum et alvum gravissima symptomata producit. LUDWIG Institutiones Medicinæ clinicæ. part. 1. cap. 1. sect. iii. § 248.

believe the bilious fever to be contagious sometimes, but I have observed the yellow fever to be much more so. The voiding of black bile upwards and downwards is almost the only symptom in which our disease differs from the yellow fever. The *petechiæ*, hemorrhages, and some other symptoms, which do not attend the bilious, are common in the yellow fever. But it is to be observed, that the *petechiæ* are less in number in the yellow fever, than in our disease, and in proportion as the skin is more yellow, the *petechiæ* are fewer. The skin being mostly of a lurid colour in the disease, I am describing, makes it differ also from the yellow fever. Some medical gentlemen have informed me, that the yellow fever was sometimes attended with the vomiting of black bile, but during a residence of four years at Senegal, I had many opportunities of seeing patients in this disease, and never observed it; yet notwithstanding this I do not in the least doubt it, because I think the greatest affinity exists between our disease and the yellow fever, and I believe, as I have already said, that they only differ in the degree of malignity. The *diagnosis* was more easily formed, after the disease had raged for some time. For when healthy and strong people,

people, who either had been waiting on the sick, or visited them, were suddenly taken ill with a similarity of symptoms, it was easily conjectured, that they had received the disease from contagion, and from thence it was probable, that all those, who might be taken in the same manner, would labour under the same disease, and that it was contagious.

To institute the *prognosis* was as difficult a task, as to form a *diagnosis*. In the onset of the disease, the issue, it would take, could not be foretold. There were no true prognostics in the beginning, presaging death or life, except that one might guess from the severity of the symptoms, that death would soon be the consequence. A slight *diarrhœa*, with a cessation of the vomiting and the *singultus*, together with an abatement of the rest of the symptoms, followed by a gentle and general sweat, gave the best hopes for recovery. The vomiting of black bile was a certain sign of ensuing death. Not one, as far as I know, who had that symptom, recovered, and I have little doubt, but that a similar evacuation by stools was also a mortal sign, yet as it was always preceded by vomiting, and never happened alone, I can not so positively assert it. I have,

I 2

however,

however, seen enough of it, to be quite convinced of the truth of what HIPPOCRATES* and CELSUS say on that occasion†. The inflammation of the eyes, the weakness or dimness of sight, and the difficulty of swallowing, were bad signs. Those few patients, who were afflicted with the latter, did not survive long after it had taken place, although the other symptoms did not seem to be very severe. The colour of the *petechiæ* is hardly of any consequence in forming the *prognosis*. I have seen them from a florid red colour, with which they mostly at first appeared, become pale and even livid, and still the patient, in which this happened, recovered.

Having before given a description of the symptoms of the disease in their succession, as well as an account of the general course of relapses, together with what happened to those, who recovered of the disease, during their first

* Morbis quibuscvis incipientibus, si bilis atra vel sursum vel deorsum prodierit, lethale. HIPPOCRAT. Aphor. 22. sect. 4.

† Is acuto morbo facile consumitur, cui protinus in recenti morbo bilis atra vel infra vel supra se ostendit. CELS. lib. 2. cap. vi.

state of convalescence, and having just now shewn, how far it was possible to form a *diagnosis* and *prognosis*, I think this a proper place to endeavour to ascertain with what *genus* of fevers the disease is to be classed.

The following definition, which the learned Doctor CULLEN gives of the *synochus* in his *synopsis nosologiæ methodicæ*, seems to me to be the most applicable to it: The *synochus*, says he, is a contagious disease; a fever composed of the *synocha* and *typhus*, in the beginning a *synocha*, in its progress and towards the end a *typhus**.

The *Synochus* being a composition of these two diseases, I will here subjoin their separate definitions, taken from the same author, in order to facilitate the judgment of the reader. The diagnostics of a *Synocha* are:—a much increased heat; a frequent, strong and hard pulse; red urine, and the functions of the brain not much disturbed†. In the *Typhus*:—

* *Synochus morbus est contagiosus; febris ex synocha et typho composita, initio synocha, progressu et versus finem typhus. Loc. cit.*

† *Calor plurimum auctus; pulsus frequens validus et durus; urina rubra; sensorii functiones parum turbatae. Loc. cit.*

In

the heat is not much increased, the pulse small, weak and mostly frequent; the functions of the brain very much disordered, and the strength much diminished*.

Our disease was generally a *Synocha* in the beginning, but it often ended in a *Typhus*. The pulse was for the first three days almost in every patient remarkably full, though for the most part rather soft; yet in many it was hard, and particularly in those, who had inflammations of the eyes or symptoms of a peripneumony. It is to be observed, that those patients, who had a very full, but rather a soft pulse, were mostly emaciated and weakened through a long residence in the country. Those, who were stout and robust, and not previously debilitated, had generally a full and hard pulse with some inflammatory symptoms. For which reason I look upon this as the true and characteristic pulse of the disease in its beginning. For though the soft pulse was the most general, yet it was too full for the pulse of a *Typhus*. Besides this, most of the other diagnostics of a *Synocha* (a few deviations excepted)

* Morbus contagiosus; calor parum auctus; pulsus parvus, debilis, plerumque frequens; sensorii functiones plurimum turbatae, vires multum imminutae Loc. cit. correct-

corresponded with the beginning of our disease.

These deviations, consisting in some patients in a diversity from the general symptoms, occasioned by a particular difference of habit, make it a difficult matter to ascertain the true *genus* of our disease. But those are to be set aside, as happening in most continued fevers, and then it may be said in general, That the diagnostics of a *Synocha* were applicable to our disease from its beginning to the third day, the pulse remaining full and frequent, and only becoming small and weak a few hours before death; but that in those, who survived the third day, the diagnostics of a *Typhus* took place, such as a small and weak pulse, failure of strength, and *delirium*. After a full consideration, therefore, of what I have said, I do not doubt, but that every one will join with me in opinion, and not hesitate to refer the disease to the *genus* of *Synochus*, according to the abovementioned definition.

It is also customary to annex some epithet to the generic name of a disease, in order to distinguish its particular species from others belonging

longing to the same genus. The epithets are sometimes formed by subjoining to the name of the genus the name of the place, where the disease raged, or the season of the year, in which it happened; but they are more frequently, and in my opinion more justly, taken from some prevailing or fatal symptom. This being the case, no symptom can more properly indicate the species of the disease in question, than the black bile, which is evacuated upwards and downwards. For which reason; I shall be justified in joining to its generic name an epithet expressive of this peculiar symptom, and that I may therefore with strict propriety term it the *atrabilious Synochus*, or *Synochus atrabiliosa*.

As it will be expected, that I should say something of the predisposing or remote causes of the disease, I shall therefore submit to the task, but not without much diffidence of succeeding satisfactorily. It is a difficult matter to ascertain these causes, and it has always been considered so in the doctrine of Pathology; on account of its being subject to so many errors. They are sometimes so slight, inconsiderable and latent, that they can hardly be investigated,

vestigated, and for the most part they are doubtful and only conjectural*. Yet as I think those, which appear to me to be predisp-
 onent, were sufficiently obvious and chiefly
 occasioned by the heat of the weather, the
 constant use of animal food without fresh ve-
 getables, and the brackishness of the water, I
 will state them to the best of my judgment.

We must here recur to what I have said in the
 remarks to the journal of the weather at Senegal ;
 That the wind during the months of May and
 June, which precede the rainy season, is always
 northerly, or at least stated between north
 and north-west. This wind, as it comes from
 the sea, is called the sea-breeze, and is reckoned
 there to be the most wholesome of all winds ;
 but what is remarkable, it does not penetrate
 beyond sixty or seventy miles into the interior
 parts of the country, though it should blow
 pretty fresh at Senegal, as being near the sea,
 and being only separated from it by a small
 neck of land. The sky is at this time mostly
 clear ; the air dry, and the beams of the sun

* Neque enim datum mortalibus, aut suam aut re-
 rum, inter quas versantur, naturam penitus compre-
 hendere. Institutiones Patholog. medicin. GAUBII.
 De disciplina medica.

are not interrupted by any clouds. For which reason the heat is intense, and the mercury in FAHRENHEIT'S thermometer very often rises to ninety degrees and upwards; but as it only ascends on some few days to the eighty-second degree, I will take the *medium* between ninety and eighty-two, which on an average will make the constant and daily heat during this time to be eighty-six degrees of FAHRENHEIT'S thermometer*. In the latter end of June, and the
two

* On my first arrival at Senegal, in the beginning of the year 1775, I kept a journal of the weather, but after having continued it for some months, I neglected it; nor did I think it worth while to put any observations of the weather to paper during those months, which preceded this fatal disease, because I found nothing extraordinary in it, except that the heat was rather more intense, than what it usually had been in other years about this time. But when this disease (and such a disease I never had seen before) made its appearance, I began the prefixed journal, and now regretted I had ever laid it aside. Though I kept no regular journal at any other time, but what I have related, yet there hardly passed a day, that I did not look at the thermometer, particularly when it was uncommonly hot, but I never found the heat exceed ninety-three degrees of FAHRENHEIT'S thermometer. This heat may not appear extraordinary for that place, because it has always been thought to exceed this measure
by

two following months, the sun returning from the tropic of Cancer, and advancing towards

K 2

the

by far, and according to a list of extreme heat and cold of the weather, in different parts of the globe, inserted in a book written in the German language by Professor ERXLEBEN, on the first principles of natural philosophy, the heat at Senegal is said to have been on the twelfth of April, 1738, one hundred and eight degrees and a half of FAHRENHEIT's thermometer. But I must confess, that (although I will not dispute the authority of this observation) I am inclined to believe, that this amazing difference from my own observations must have been owing in this case to the thermometer's being misplaced, or to its imperfection. Again, when I find, that FAHRENHEIT's thermometer rose to one hundred and twelve degrees in the island of Sicily, during the time of a Siroc wind, according to Mr. BRYDENE's account, in his tour through Sicily and Malta, I am almost induced to consider Senegal as a temperate place. However, I shall only observe, that a heat of ninety-three degrees, or thereabouts, continuing for several days, and abating only three or four degrees during the night time, feels very disagreeable, and there is no doubt, but it must produce bad effects on the body. I never slept well, when the heat was about eighty-five degrees and upwards during the night; and though all the windows of the room were open, yet I was sometimes obliged, when the weather was calm, to quit my shirt, and lay quite naked on the bed, which was only hung round with thin and airy curtains, to keep off the musquitoes. An heat of ninety-three

K 2

degrees

the Equator, darts its rays almost vertically for a second time. To be exposed to them about noon, is considered by the natives themselves as very dangerous. They will often advise newly arrived Europeans, to avoid them with the greatest care. Such an exposition to the sun produces sometimes on a sudden apoplexies, with immediate death; and at other times fevers, called by the French *Coup de soleil*, and by the English *Sunstrokes*, which mostly prove fatal to the patient on the second or third day.

Though this weather, considering the climate, cannot be called unwholesome, yet it affects the body in so sensible a manner, as to produce in it an alteration for the worse. The dry and hot air increases not only the circulation, but it also rarefies the blood and the other fluids of the body to a great degree, in consequence of which the vessels, containing

degrees exceeds that of the hottest day in England by ten; (for, to the best of my knowledge, eighty-three degrees is the highest station of the thermometer in this island,) and those who have observed the difference, which the increase of one single degree of heat causes in the feeling of the body, when it is once above eighty, will not think little of the difference produced by ten degrees above the hottest day in England.

them,

them, being too much dilated, are greatly relaxed. Besides this, the same air, instead of a gentle perspiration, causes sweats, which even happen sometimes, when the body is entirely at rest; but when it undergoes the least motion, they are very profuse. Experience has taught us, that profuse and long continued sweats are as hurtful, as a gentle perspiration is beneficial to the constitution. They deprive the blood of a part of one of its constituent fluids, necessary for the nutrition of the body, by which this latter is not only weakened, but a *dyscrasia* also takes place in the blood itself, from the great loss of the *serum*, the thinnest and mildest portion of which is thrown off, leaving behind the more acrid, as containing a quantity of salt in a concentrated state*. I will here by no means deny, that the sweat does not carry off some salt along with it, because its saltish taste proves it. But this portion of salt is very inconsiderable, in proportion to the immense quantity of sweat, which is thrown out, and it must also be very small

* Neuter (circuitus nempe humorum, naturæ modum excedens, et calor immoderatio) diu tolerabilis, quin aqua avolet, et mite oleum cum sale acrescat. Institutiones Patholog. med. GAUBII. De acritatibus morbosis.

in proportion to its remaining part within the body, the existence and abundance of which is confirmed by the sharpness of urine, as well as the continual thirst.

One might be induced to believe, that the blood, deprived of its thinner portion, would be inspissated; but the contrary commonly happens. This perhaps may arise from the remaining acrid portion of the *serum*, acting upon, and in a manner dissolving the *gluten* of the blood, which being destroyed, the blood itself must become thinner.

It is to be further observed, that neither the fluids, necessary for the nutrition of the body, nor the mild *serum*, carried off by sweat, can easily be replaced by good meat and drink, because the same cause, which produces the extraordinary sweats, produces also a relaxation of the solids. For which reason those powers, by which digestion and chylification are performed, must also be unfit and unable to prepare such chyle, as would remedy this evil*; and I think that such a vitiated chyle cannot but inqurate the

* The extraordinary sweating and relaxation of the solids seem to be the principal causes, why most Europeans become thinner in hot climates.

blood more and more, since the same cause still subsists, I mean the heat, promoting sweat, and relaxing the solids.

The garrison subsists during the whole year chiefly upon animal food, and particularly upon fresh beef, which is supplied by the Moors. When live cattle cannot be procured, which is sometimes the case, (when any dispute happens between the Governor of the island and the neighbouring nations, or when during the hot and dry months, preceding the rainy season, the cattle, for want of pasture, is so bad and lean, that its meat can hardly be eat,) then salt beef or pork is distributed in its room. The flour for the baking of bread, which is supplied from England, turns often musty, when it has been kept any time in store. Fresh and green vegetables of all kinds are at this time wanting, on account of the dryness of the ground. Fish is to be had in great plenty. The river and the sea-coast near Senegal abound with it, and the Europeans eat it very often for variety's sake; but it is the chief article of food among the inhabitants, who prepare and season all their different dishes of Guinea corn with it, the whole year round.

It

It is the opinion of many (and I am of the same opinion) that the continually feeding on fish predisposes the body, in a great degree, to putrid diseases, unless a proper quantity of acids is made use of at the same time to correct this putrid tendency. The inhabitants of Senegal seem to know this from experience. They use a quantity of butter-milk between their fish meals, which, though it is very dear, and much dearer than fresh milk, they think so necessary for their health, that they would rather choose to be deprived of other necessities of life, than this article*. The Moors on the north side of the river, who prepare and sell the butter-milk, use it likewise liberally, and it may be said, that it is one of the chief articles of their food, for which reason it is so dear on the island, as they only bring for sale, what they may not want themselves.

* All compound animal food, such as fish, promote, without proper correctors, the general tendency to putrefaction, in those which feed on them.——With such food acids are highly proper, and hence the great propriety of using much butter-milk, where fish is the common food. Doctor ALEX. WILSON's observations relative to the influence of climate on vegetable and animal bodies. The second part, the 15th chapter, page 134 and 135.

The

The island of Senegal and the adjacent continent differ much from other countries, situated in the same latitude, in this particular, that they produce none of those fruits by the use of which the noxious quality of the animal food might be corrected. I mean oranges, lemons, limes, plantains, bananas, ananas and every other kind of this class, except tamarinds; but the use of these cannot be persisted in, on account of their purging quality.

It being a known fact, that all animal substances putrefy spontaneously, and very soon; when exposed to a proper degree of heat joined with humidity; it is obvious, that the chyle; which is elaborated from such substances; when taken in food, must partake in some degree of the ill quality of the substance, from which it is formed, and have the same tendency to putrefaction. But this noxious quality and tendency of the chyle is easily prevented; corrected and subdued by the alternate use of proper vegetables, or by the energy of the vascular system. When, therefore, the flesh of animals is taken for constant food in a hot country, where the heat and every other circumstance favours this putrefaction, both vegetables and strong vital powers are highly
L
requisite,

requisite, to prevent its bad effects. The latter in particular are much wanting, for the weaker they are in a living body, the nearer is it to death itself, and of course more apt to undergo the same putrefaction. But the long continued hot weather, such as we have at Senegal, induces also a relaxation of the solids, as I have said before, and the vascular system must of consequence be weak and unable to perform this task. For which reason proper vegetables are the only resource remaining to correct this bad quality of the animal food; but these being entirely wanting at this time of the year, this correction also cannot take place. The blood, therefore, as being made up of an ill conditioned and badly elaborated chyle, must in some degree participate of the same bad quality, and have an innate propensity to putrefaction, ready to break forth, as soon as additional circumstances favour its action.

Though the tide is inconsiderable at Senegal, yet it flows about thirty leagues up the river during the dry season, on account of the weakness of the current. The water, therefore, surrounding the island, is salt during this whole time, as the distance from the mouth of the
river

river up to the island is only fifteen English miles. The well water, which is principally used on the island, being nothing else but the river water filtrated through the sands of the island, and gathered in holes dug for that purpose, is brackish during the whole year; for though the river water is fresh in the rainy season, yet the sands of the island, through which it filtrates, are so impregnated with salt, that it dissolves a sufficient quantity of it, to make it brackish, in its passage to the wells. The well water has also in some parts of the island a slight yellowish colour, which it imbibes from various noxious substances, mixed with the sands, through which it filtrates*. Though the

* The black inhabitants, being for the most part Mahometans, had formerly been allowed by those Europeans, who were then in possession of the island, to bury their dead, according to their custom, within or near their dwellings. At that time they were but few in number, but afterwards increasing very much, this custom still prevailed, and hence the ground is full of human bones in several places. During the time of my residence there it was always prohibited, and they were obliged to carry them across the river, and bury them on the continent; but this they did not like at all, and would still sometimes bury their nearest relations within their huts, when they were not closely watched. The reason of it is, the continent swarms with *hyæna's*, which

the water of the river is (as I have said) fresh during the rainy season, yet the principal mulattoe and black inhabitants do not like to make use of it in preference to the brackish well water; and the reason they alledge, is, that being accustomed to the fresh river water for a time, and afterwards obliged, when it becomes salt again, to return to the brackish well water, this will occasion fluxes. Though there may be some truth in this, yet as every method, to preserve health, is to be pursued during the rainy season, as the most dangerous of the whole year, it is consistent with reason, that fresh water should be used in preference to that which is brackish; and if this aim of preserving health at this time should be obtained by this means, it is more than an equivalent, as *diarrhoeas* and fluxes, if they should be occasioned

are so fond of dead human bodies, that they will delve for them, and have them out, if buried ever so deep, so that perhaps the next morning the remaining bones of the limbs will be found scattered about the grave; for which reason the blacks on the continent bury their dead commonly within or close to their dwellings. There is a small burial ground upon the island for the garrison and the few mulattoe and black christians, but it would also be much better, if this was on the continent, as it certainly must contribute towards the infection of air.

afterwards

afterwards by the returning to the use of brackish water, are not very dangerous at that time, and seldom fatal, the air being then much healthier. Most Europeans make use of the river water, as long as it remains fresh, but as it is very thick and muddy*, it is com-

* It is, in my opinion, the mud of the water, that kills the fish, a quantity of which are often seen floating dead on its surface. This muddiness is partly occasioned by the earth washed and carried away from the mountains in the interior parts by the heavy torrents of rain, and partly by the violent current of the river itself, which washes the earth from its banks, and tears away whole pieces of ground, over-grown with trees and bushes, whose roots are so interwoven, that though the earth is all washed out of them, yet they stick close together, and come floating down in the form of islands of two or three acres in extent, sometimes full of large snakes. As most rivers of the torrid zone in Africa are muddy during the rainy season, some authors have imagined, that the internal use of such water was the cause of the then raging disorders, but I am far from believing it to have that bad effect, independent of other causes. “*Alexandria est fere tota suffossa, specusque habet ad Nilum pertinentes, quibus aqua in privatas domos inducitur, quæ paullatim spatio temporis liquecit ac subsidit. Hac uti domini ædificiorum atque eorum familia consueverunt. Nam quæ flumine Nilo fertur, adeo est limosa atque turbida, ut multos variosque morbos efficiat. Sed ea plebes ac multitudo contenta est necessario, quod fons urbe tota nullus est.*”

A. HIRTII de bello Alexandrino liber.

monly

monly filtrated through excavated porous stones, brought for that purpose from the island of Teneriffe. Some of the most opulent Europeans fill a quantity of casks with fresh river water in the months of October or November, when the current of the river has abated, and the mud subsided, and keep it for their own use during the dry season.

The experiments made by Sir JOHN PRINGLE prove, that fresh meat will sooner putrefy, when infused in water, which contains a small quantity of sea-salt in solution, than it would without any salt*. I do not know, if one may conclude from thence, that salt, when taken inwardly, will have the same effect, as it has, when applied to fresh meat; yet many are at present of this opinion. The learned author seems to think so himself, and he quotes BECCHER as the only one, he knows, who has been of that opinion, whose words, as they are much to the purpose, I have here transcribed†. I am entirely of their opinion, and the

* Appendix to the observations on the diseases of the Army. Experiment xxv.

† Et hæc est ratio, quod soleamus in quotidiano usu saltem edere; ut nempe crassiora digerantur et resolvantur :

the following observations, I have no doubt, will sufficiently account for it: Nothing seems to be more necessary for the seasoning of our food than salt, and indeed some think it quite indispensable, because we are so much used to it from our very infancy; but this is a wrong notion, and people, unaccustomed to its use, may do very well without it. There are countries, which are destitute of salt, and that, which may be imported from others, bears so high a price, that the poorer sort of people cannot afford to buy any of it. A tract of land in the interior part of Africa, called Galam, is of this number*. It lies to the eastward of

vantur: sed cum nimium eo utimur, necessario salis acrimonia mixti animalis compagem solvit et corrumpit: imo hoc in passu, si humiditas superveniat, in horrendam putredinem ducit. *Physic: subterranean: lib. I. sect. v. cap. I.*

* There seem to be many districts in the interior parts of Africa, where no salt is used. SALLUSTIUS says, that the inhabitants of a great Numidian town, called Capsa, and those of many other places in Africa did not use any, which, however, he does not attribute to its scarcity, but adduces other reasons for it: Id (malum nempe inopiæ aquæ) ibique, et in omni Africa, quæ procul a mari incultius agebat, eo facilius tolerabatur, quia Numidæ plerumque lacte, et ferina carne vescabantur, et neque sale, neque alia gulæ irritamenta quærebant. *De Bello Jugurthino.*

Senegal,

Senegal, and is said to be nine hundred English miles distant from it. A small fleet of vessels, from about twenty to thirty tons burthen, goes there every year from Senegal, setting off in the month of July or August, and arriving there with much trouble in about six or seven weeks, being obliged to work and warp their vessels against the violent current the whole voyage; but coming down again, they perform the same voyage in about twelve days or a fortnight, the current being in their favour, and generally arrive at Senegal in the beginning of December. The cargo of the vessels, besides a few manufactured goods, such as guns, powder, balls, India bast, beads, &c. consists of salt, which is to be had plentifully near Senegal, and the whole trade, on account of the inclemency of the weather at that time of the year, which generally kills those Europeans, who have courage enough to undertake the voyage, is entirely carried on by the mulattoe and black inhabitants of the island, partly on account of some European merchants and partly on their own*. The articles

* It may be wondered at, why this voyage is not performed in the dry and healthy season of the year. The reason is, that there are certain falls high up the river,

articles of trade and the salt, which they carry, are sold, or rather bartered, for ivory, gold and slaves, which latter are either prisoners of war, or subjects of the principal people, born in slavery. Some of those inhabitants of Senegal, who have performed that voyage twenty times and more, assured me, that the poorer sort of people in that country, and particularly the slaves, never season their victuals with any salt, and that many of them do not even know the taste of it; but that the richer sort carry commonly a small quantity of it about them, tied up in a small leather pouch hanging by their neck, out of which they take a few grains and strew it upon each mouthful of victuals*. The slaves, therefore, which are bought there, being unaccustomed for the most part, to eat

river, occasioned by rocks, which are not passable but in the rainy season, when the waters have risen so high, as not only to bring them on a level, but also to admit of a passage for those small vessels.

* Formerly a measure of salt, containing about two pound in weight, was sold there for a drachm of gold, equal to ten shillings sterling, and some of those, who bought it, carried it again into the interior parts of the country, and sold it at an hundred or two hundred per cent; but of late years they have carried such quantities there, that its price is greatly fallen.

M

victuals

victuals seasoned with salt, the masters of the vessels take the greatest care not to give them free indulgence in the use of it, but allow them only a trifling quantity, in order to accustom them to it by degrees; and the same precaution is observed, when they are put on shore at the island of Senegal, till they are transported in an European vessel to the West Indies. This method is pursued in order to prevent the scurvy, which experience has taught the traders, the free use of salt will produce in these people; for whenever it happens, through the neglect or carelessness of those who have the inspection of their victuals, that they indulge too much in it, they are soon seized with this horrid disease, of which they seldom or never recover. But it sometimes happens, that those, who have been treated with the greatest precaution, are also seized with this disease; the cause of it must, therefore, be looked for somewhere else, and I think it may be partly found in the brackish well water, in which their victuals are boiled, and which serves them as constant drink. As many of them are locked up together in the same room during the night, the impure air, which they breath, and the want of motion during the day time, which the irons on their feet imposes on them,

them, cannot but somewhat contribute towards it; yet those slaves, who are bought nearer to Senegal, and are of course accustomed to the use of salt, are seldom affected by it, or at least not near so much as the former. The brackish water, therefore, (as containing a small quantity of salt independent of its other bad qualities) of which they drink large quantities to quench the thirst occasioned by the heat, I think may be considered as one of the chief causes in producing the scurvy in them, but particularly in those, whose intestines are not irritable enough to be purged by it, as it then enters the blood continually and gradually, and causes this disease instead of *diarrhæas* and fluxes.

The brackish water having so sensible an effect as to produce the scurvy in those, who are unaccustomed to the eating of salt, at an healthy time of the year, I think, it may well be allowed, that the use of it during the hot months preceding the rainy season, must be in some degree injurious to the health of the Europeans and the inhabitants. For though this custom may be the reason, that it affects them less, and enables them to bear it better, yet when its bad qualities are not counteracted

by proper vegetables, it must have a sensible but pernicious effect on the blood, and induce in some degree a predisposition in it, analogous to that of the scurvy. Now, as a relaxation of the solids and a resolution of the blood, attended with *petechiæ*, terminating in a putrefaction of the whole body, are the final effects of the scurvy, and are also the final effects of the disease I am describing, I conclude (tracing these effects to their causes), with a late celebrated author, that the same cause, which produces the scurvy at one time of the year, may greatly contribute towards the generation of our disease at another time of the year, when other concurring causes aggravate and accelerate its effects*. I consider, therefore, the brackish water as one of the predisposing causes to our disease, and, after a full consideration of what I have alledged, I have no doubt but it will be thought so by others.

* If the acrimony is great, and the nerves thereby suddenly affected, a fever with putrid symptoms, a vomiting, or a flux will ensue. But if the accumulation is so slow, that the nerves grow in some manner habituated to the putrefaction, a scurvy prevails. Sir JOHN PRINGLE's appendix to the observations on the diseases of the army. Experiment xlviii.

Having

Having before given a short description of the hot and dry weather during the months of May and June, and endeavoured to explain its effects on the body, I shall now attempt to do the same with regard to the rainy season, which begins commonly in the month of July, sooner or later. The wind, which during the preceding months is for the most part northerly, verging now and then a little towards the west, now shifts its quarter, and is commonly more or less southerly. The sky is mostly cloudy, and calms as well as tempests are very frequent. The latter are called *Tornados*, and are accompanied with storm, thunder, lightening and heavy rains. The river soon swells from those rains, overflows its banks, and deluges the surrounding low lands, by which large lakes and pools are formed, when it afterwards returns within its borders. The Moors on the north side of the river, who have no settled place of abode, but live under tents, which they are continually shifting, leave at this time, for the most part, the low country near the river, and retire to the northward, to a more elevated and salubrious part, where they are neither subject to inundation, nor so much infested with musketos. Though the weather

is so very hot before this time, yet many species of trees do not begin to shoot their leaves before the rains come on, which I think must be entirely owing to the dryness of the ground and the atmosphere; but they become green almost suddenly and in a few days after there has been a shower of rain. The dry and sandy soil, which seemed to be burnt up by the heat of the sun, is now soon covered with grass and plants. The whole country becomes one continued verdure, and affords the most pleasing sight of the whole year. The weather is so favourable to vegetation, that even in the sandy streets of Senegal young trees, such as cotton, tamarind and *adansonia* sprout forth from seeds, which had been thrown there by chance; but it is also well adapted to the breeding of insects, different kinds of which now make their appearance in innumerable quantities, and are a great plague to the human species, but none are worse than the musketos, as they are most troublesome during the night time, and deprive the people of their rest, unless their beds are well secured with proper pavilions, for which reason they prove very hurtful to the soldiers, who are not thus provided, as nothing is more apt to cause fevers, than the want of rest.

The

The air is so much charged with humidity and various pernicious exhalations, that there is hardly any thing, which is susceptible of its impulse and influence, that is not more or less affected by it. It is also very hot from the proximity of the sun, which is then near the zenith of Senegal, and (according to the opinion of CELSUS) very pernicious in this particular respect, that it sometimes darts out on a sudden from between the clouds after heavy *Tornados*, and raises the most noxious vapours, for which reason the walking abroad at such a time is carefully to be avoided*.

It is easy to conceive, that the air, being thus loaded with moisture, must more or less suppress the perspiration of the body; hence not only the small quantity of salt, which was thrown out before by the flowing of the sweat, but the rancid and more putrescent particles, which are now so easily and abundantly generated by the joint action of heat and moisture, and retained within the body, will no doubt

* *Minimeque nubilo coelo, soli aperienti se committere, ne modo frigus, modo calor moveat: quæ res maxime gravedines destillationesque concitat. Magis vero gravibus locis ista servanda sunt, in quibus etiam pestilentiam faciunt, Lib. I. cap. ii.*

induce a more or less putrid acrimony in the blood, in proportion as it has been more or less predisposed to it by the former weather, the animal food, and the brackish water.

That this may not appear contradictory to what I have advanced before, where I considered the flowing of the sweat as the cause of debility and an acrid *dyscrasia* in the blood, in consequence of which it might be supposed, that its suppression would not be attended with the above bad consequences, I beg leave to observe, that I then talked of profuse and long-continued sweats only, the effects of which I think as pernicious as I have alledged them to be; but did not mean to include under this head the moderate perspiration of the body, which I consider as one of its most necessary and salutary excretions, and of whose efficacy in preventing and curing rising fevers I am as well convinced, as of the bad consequences attending its suppression; for I have known officers of the garrison seized with a fever and a violent headach in consequence of a few hours suppression of perspiration, and I have seen them as soon recovered of it by the return of perspiration, brought on by a large draught of Rhenish wine and Pyrmont water.

It

It is evident in many instances, that the secreted humours of the body are very sharp, acrid, and prone to corruption, at this time of the year. Both sexes are subject to ulcers in their genitals, though they are free from all venereal taint. In men they happen on the *glans*, or on the inside of the prepuce, and in women on the inside of the *labia*, and are occasioned by the local and natural secretions of those parts, when the washing of them with cold water has not been duly attended to. Those males, whose prepuces cover the *glans*, as is the case with many Europeans, are the most subject to them, and the blacks, who have naturally longer prepuces than the Europeans, would be still more liable to them, if it were not for circumcision, which is generally practised there, not only among the Mahometans in consequence of their religion, but also among others of quite different persuasions, commonly called Pagans, who, when they are asked the reason of this performance, give for answer, that the gathering of nastiness, its corruption, and consequential ulceration is thereby prevented*. For the
same

* Among the Moors this operation is performed, when the boys are about four or five years old ; but among the black nations not before they are near the
N age

same reason many of the Mulattoe and black Christians of the island, though born of Christian parents, have the operation of circumcision performed on them about the age of puberty. Even the women of the Moors, which dwell on the north side of the river Senegal, have a sort of circumcision performed on them, which consists in the cutting away the *clitoris* and *nymphæ*, and the want of them does not in the least injure the functions of the whole*. As they are Mahometans, it might be supposed to be a religious rite, as I have been informed, that

age of puberty. It is done by a *Marabbut*, or Mahometan priest, who, by tying a string to the prepuce, and pulling it forward, cuts it with a sharp knife close behind the ligature, after which the remaining skin draws back, and leaves the *glans* bare. The wound is first strewed over with wood ashes, and afterwards dressed with a greasy substance of the consistence of tallow, which comes from the interior parts of the country, and goes by the name of *Galam* butter, and which, in appearance, smell and taste seems to be the oil, otherwise called butter, of cacao nuts

* Apud Arabes equidem et Aegyptios frequentissimum esse, ut nonnulli referunt, noxæ genus illud (clitoridum scilicet nimis magnarum) consuevit, adeoque puellis recens natis, quidquid indecenter prominet, resecinditur. L. HEISTERI institutiones chirurgicæ. p. 11. f. c. v. cap. cxlviii.

there

there is something analogous to it performed on the Turkish women; but two of them, seemingly not the most learned in religious matters, with whom I was acquainted, and who had been deprived of those appendages in their younger years, told me, that it was a general custom among the Moorish women of cutting them away in their children for the sake of cleanliness, as they were apt to harbour impurities, and hence much subject to ulceration during the hot weather, and they added, that they remembered well, when they underwent excision*. It has been further related to me, that the black women have also a custom of cutting away the *clitoris*, but only in that case, where it is longer than naturally, and where it protrudes so much, as to be seen outwardly, which is considered by them as one of the greatest natural deformities, and thought so disgraceful, that when they are unjustly reproached with it in any dispute, they are much enraged, and sometimes prompted to give the bystanders ocular conviction of the contrary.

The acrimony of the humours, I think, even manifests itself in those animals, which are

* *Aestate ulcera cum in cæteris quidem partibus, tum maxime obscœnis oriri solent. CELS. lib. 2. cap. i.*

not quite originals of the country. The horses, which come mostly from those parts of Morocco, nearest to Senegal, and of which the principal people only have a few, are often, for want of grass, seized with an obstruction of urine, attended with swellings in the groin, a disorder of which one of the earliest navigators to these countries takes notice*. I think the cause of it may be sought for in the sharpness of urine, by which it is possible, that the bladder and the parts adjacent and subservient to it, may be thus inflamed. I do not suspect a stone to be the occasion of it, as I have been informed by a gentleman of great experience in the diseases of domestic animals, that a horse may carry one of a large size without much molestation for a long time, and that the situation of the bladder does not admit of its obstructing the urinary passage†. It may perhaps be with a view to correct this acrimony of the

* *Equorum illic ingens pretium est, nec facillime illi aluntur, ob aridam tellurem: nam torrida est plaga, quæ pabula non producit, facitque æstus nimius, ut equorum inguina intumescant, ut vix inciere possint. Navigatio Aloyfii Cadamustii. cap. xxxii.*

† Mr. KERSTING, teacher of zootomy and lecturer on the diseases of domestic animals, at the Royal Veterinary School at Hanover.

the urine and the humours in general, that the chiefs of the Moors allow their horses, besides a proper portion of Guinea corn, a certain quantity of cows milk instead of water, during the whole year round, or at least at such a time, when proper pasture is wanting for them*.

The

* It seems almost contradictory, that the cows of which the Moors have great herds, should be able to subsist and furnish milk for the horses, where there is no pasture for the latter. But this is really the case, and for this reason, that the cows of that country are not very nice, and can live upon such pasture as the dry season affords, which is really so bad, that horses and even English cattle would soon be starved by it. For though the latter part of the rainy season furnishes plenty of grass, or rather a sort of reed eight or nine feet high and more, on which the horses feed, as long as it is tender and green, and on which the cattle soon fatten, yet it is but of short duration, and it becomes soon after the rains cease, as dry as a chip, and is only proper for camels and asses. When it is in this condition, the Moors have a curious method of providing a new, but indifferent sort of pasture for their cattle. They set fire to it, and let it burn to a great extent, till some creek of the river or barren place puts a stop to it, by which means it happens, that the remaining roots shoot forth new sprouts some time after, and on these the cattle live. The blacks use the same method of clearing and manuring the ground, before they plant
their

The itch is annually, during the rainy season, endemial among the blacks, but particularly among the young ones. Its pustules are large, but not so full of *pus*, as is the case in the moist itch of Europe ; they are rather blotches, covered with thick crusts, attended with much itching. The disease yields to the internal use and external application of sulphur, but the blacks seldom take any thing for it, as it commonly disappears spontaneously after the rainy season is over, but returns mostly in those, that are subject to it, at the same season of the next year. Contagion may be the cause of it in some, but in general it seems to generate within the very bodies, affected with it, and to be owing to a particular acrimony of the humours, aggravated by the suppression of perspiration, but differently modified from that, which occasions putrid diseases, as those, who have it, are seldom seized with these. Yet if nature did not take this method of freeing the body from it by a suppuration in the skin, it might perhaps degenerate into such a state, as would produce putrid diseases, be-

their corn, hence the horizon appears in the night, during a great part of the dry season, in a blaze from several such fires, burning in different places of the country.

cause

cause we have instances, where a repulsed itch has been supposed to be the cause of them. Although I maintain a particular acrimony to be the cause of the itch, yet I do by no means intend to deny its being the consequential production of insects breeding within the skin; but I believe that those insects cannot be generated without such a preter-natural state of the fluids, and, I think, that the disorder cannot take place spontaneously without it, nor be endemial.

All other cutaneous diseases, of various denominations, which are so common in Africa, are mostly worse during the rainy season, and the cause of it seems to be the increased acrimony of the humours. Even the Guinea worm, called *gordius* by LINNÆUS, and *vena medinensis* by others, which, though it sometimes perforates the muscles and even the ligaments of the joints, may be considered as a disease of the skin, is more common at this time of the year, than at any other*.

During

* As this is a disorder not known in Europe, I shall just take notice of an extraordinary instance of it: The right foot of a black girl had been much inflamed for a time, when a boil appeared afterwards near the inward
metatarsal

During the rainy season the sweat of most blacks is remarkably fetid, whenever its flowing is occasioned by labour or other exertions. As they are continually bathing and washing themselves, this bad smell cannot proceed from any nastiness harbouring on the surface of the skin, but must be owing to the sweat itself. In some it is so very offensive, that I have seen instances, where it had such an effect on delicate Europeans, as to make them sick at the stomach. These foul and nasty vapours, exhal-

metatarsal bone, which breaking, the head (as it is called) of a Guinea worm made its appearance. In the mean time another boil near the outward metatarsal bone opened, and the head of another Guinea worm shewed itself. I took hold of the one and the other, and wound as much of each, as followed easily, upon two separate little sticks. I continued this work every day for about three weeks, and then nothing more would follow by pulling, but I observed, that while I was pulling the one stick, the other was drawn close to the skin, which shewed, that what I had wound upon the two sticks, were the two ends of one and the same worm. I, therefore, unrolled the end of the worm from the one stick, and by pulling the other, it re-entered the foot, in which it made different windings, and came out at the other boil. The whole worm was two yards long, and not so thick as the smallest chord of a violin, but which of the ends was the head, if there is any, I cannot pretend to say.

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ing more or less from the skin of most blacks, when they are sweating, or even perspiring, induce me to believe, that their bodies are constitutionally better adapted to throw off this rank and noxious matter, formed in the fluids, by the outlets of the skin, than the Europeans, and that it is for this reason, that they are less subject to those putrid diseases, which originate from its retention within the body; for it cannot be supposed, that this noxious matter should be more copiously generated in their bodies, than in those of Europeans, as they seem to be intended by Nature to inhabit that country.

The sweat of most Europeans, whenever it flows, is also more fetid at this time of the year, than at any other, and though its feter is not to be compared to that of the blacks, yet it indicates the existence of rancid and putrid particles in the fluids; and its yellow colour, by which the shirts of some people are as deeply tinged, as if they had been dyed in a tincture of saffron, shews plainly, that the *serum* of the blood is preternaturally affected. It is, besides the yellow colour, loaded with a greasy substance, which is also absorbed by the

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shirts, and makes them feel oily after they are dried*.

I am inclined to believe, that it is bile itself, diluted with *serum*, or a matter very analogous to it, which is thus thrown out by the skin; yet I do not think, that it is elaborated in the liver, and taken up again into the circulation, as is mostly the case in the jaundice; but believe it to be generated in the blood. This may appear improbable, but if it is considered, how much the blood is overcharged with the ingredients for bile, which if secreted in the liver, and poured into the intestines, would be much more, than what is requisite for the digestion, it becomes probable, that those ingredients may form a sort of combination in the circulation, and be partly thrown off by sweating and perspiration.

Though the blood is so much infected with bilious matter, that it often conciliates a yellowish cast to the skins of many Europeans; yet the bile never accumulates in it to such a degree, as to form a real jaundice, depending on this single cause. The heat of the weather

* I have known, among many others, a serjeant of a robust constitution, who enjoyed perfect health with such sweats for many years, but he fell a victim, by contagion, to the disease, I am treating of.

does not admit of its harbouring patiently in the fluids, but exalts its acrimony so much, that before it can increase to that degree, it causes, during the dry season, *cholera morbus*, or fluxes with symptomatic fevers, and in the rainy season idiopathic fevers of various denominations, some of which are attended with jaundice*.

Having mentioned the *cholera morbus*, I shall just take notice, that it is a frequent disease at Senegal during the dry season, and that it sometimes comes on without any apparent occasional cause, and seems to be the work of nature to free the body of a superabundant load of bile, in which opinion I am the more confirmed, as I have known Europeans throw up a certain quantity of bile almost every morning without any violent commotion, and at the same time enjoy a good state of health. A sudden suppression of perspiration, or perhaps a contraction of the vessels on the surface of

* CELSUS recommends cold bathing, or the swimming in cold water, when the jaundice happens in summer. This may perhaps be with a view of avoiding or counteracting the bad effects of the heat on the diffused bile: Si aestas est, frigidis natationibus utendum est. Lib. 3. cap. xxiv.

the body may sometimes be the occasional cause of this disease, as I have known it come on in an officer after cold bathing; but I believe, that it is oftener occasioned, particularly in white people, by sharp and irritating food, as I have seen it take place some hours after a hearty meal of fish, seasoned with acrid spices and sauces, such as Cayenne pepper, mustard, pickles, catchup, soy, and the like. It seizes suddenly, and after the contents of the stomach are voided, a quantity of acrid bile is thrown up with repeated efforts, and sometimes a severe purging takes place in the mean time. After it has continued for a while a *singultus* comes on, and not seldom cold sweats and violent cramps of the lower extremities. It is seldom attended with any fever, and though the symptoms are so very severe, it proves rarely or never fatal. The blacks are almost as subject to it as white people, but in them it is not so violent*. The best mode of treatment

* The blacks exhibit against this disease a remedy of their own with good success. As soon as one is seized with it, they pound a few handfuls of large Guinea corn, *Holcus sborgum* *Linnaei*, in a wooden mortar, with a certain quantity of water, and make a sort of emulsion of it. The patient drinks this together with the *saccula* of the corn, and repeats it as often as it is thrown

treatment is to give *laudanum* with strong linseed tea. The dose of the former is about fifteen drops with a cup full of the latter, which should be repeated as often as it is thrown up again, until the spasms of the stomach subside. When there is no purging, but only a vomiting, a slight irritating clyster should be given, to draw the noxious matter downwards, and afterwards mucilaginous or milk clysters to alleviate the gripings. By pursuing this method, I never failed of soon relieving the patients, who had generally, after they were composed, a good sleep with a breathing sweat, and when they waked, complained of nothing but a lassitude and soreness of the legs, undoubtedly the consequence of the cramps.

It is to be observed, that during the rainy season very few, or hardly any, are seized with the *cholera morbus*, but that the evacuations of

thrown up, until the vomiting and purging cease. They do this with a view to mix a mild substance with the corrupted or acrid one, in the same manner as CELSUS advises the drinking of warm water: *Aquæ tepidæ quam plurimum bibere oportet, et vomere. Vix unquam ea sine vomitu sumitur: sed etiamsi non incidit, tamen corruptæ miscuisse novam materiam prodest.* Lib. 4. cap. xi.

bile

bile are at that time always accompanied with fevers, whose causes, from the quantity of this fluid, which is discharged, and from the convulsive symptoms it produces, one would think to be its superabundant existence in the body, and its acrimony. Those fevers rage more or less every year, but I have observed, that they are more or less malignant, in proportion as the weather is more or less rainy; so that when there is not much rain during that season, fevers are not very frequent nor fatal, but when the rains are heavy and lasting, putrid fevers are the consequence. This remark stands confirmed by twenty years experience of Mr. BISHOPP, surgeon to the province of Senegambia, whose observations I have been favoured with. The rainy season carries off also commonly those, who have been afflicted with fluxes of long standing, and who are not recovered before its setting in; and from the joint effects of heat and moisture, accelerating putrefaction, those, who have had the scurvy for some time before, undergo the same fate.

It is a fact, known almost to every one, that hot and dry air prevents the putrefaction of dead animal substances, by absorbing those
liquids,

liquids, which are necessary for that purpose*. But when it is hot and moist, particularly when it is stagnating, or which is the same, when it is not ventilated, as is the case in calms, and when it is loaded with putrid vapours, then it has all the properties of facilitating putrefaction; and all those substances, which are susceptible of it, will be more or less affected by its influence. The air at Sene-

* Fresh beef or other meat, though ever so well salted at Senegal, does not keep, but commonly enters into putrefaction. The inhabitants, therefore, whenever they kill a bullock, in order to preserve the meat for occasional use, cut the fleshy parts of it into thin long slices, about an inch in thickness and three or four feet in length, which being previously dipped into salt pickle, they expose on branches of trees or ropes to the heat of the sun, where they are in a short time dried to such a degree, that they may afterwards be kept in dry places for a long time. The dipping those slices into salt pickle is done more on account of preventing the flies from depositing their *ova* on them, or blowing them, as it is vulgarly termed, than to contribute towards their preservation. I have seen about a hundred leagues up the river Senegal the blacks prepare in the same manner the flesh of a large elephant, which was found dead floating on the water, but by what accident it had been killed, I do not know, and I haven't eat the flesh of a *hippopotamus*, or river horse, dried in the like manner.

gal during the rainy season, but particularly in the months of August and September, has all those noxious qualities.

The low situation of the island of Senegal, and the innundation of part of the neighbouring continent, may increase the moisture of the air, and in that respect add to its unwholesomeness; but as the waters at that time; when the fevers generally rage, are not stagnating, but kept in a continual motion by the great supplies of rain and the spreading branches of the river, it cannot be supposed, that the putrid vapours in the air, which I have taken notice of, should proceed from those waters*. They are visibly generated from a thousand various vegetable and animal substances putrefying on the surface of the ground. I am the more inclined to believe, that those waters do

* I find it necessary to observe here, that when the rains cease, the wind changes from south to east. At the setting in of this wind the air becomes dry, and the fury of the raging fevers soon abates, though it is then, that the lakes and pools, which had been formed by the overflowing of the river, are real stagnating waters; but their exhalations have no bad effect with an easterly wind, and are not even perceptible in the air, notwithstanding the great absorption, which may be calculated from the quick diminution of those lakes.

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not contribute so much towards the impurity of the air, as has been generally imagined, when I consider the elevated situation of Goree, which has no such inundation near it, and that notwithstanding this, the disease, which is the subject of this treatise, broke first out and raged (by all accounts) more severely there, than it did at Senegal. The island of Goree may be considered as a rock with some slanting ground, surrounded by the sea. It is nearly two leagues distant from the continent, which is also very high land, and cannot be overflowed, if it even had any capital rivers, which it has not. The exhalations, therefore, from fresh water seas cannot be accused of having there contributed towards forming the disease. But it is to be observed, that the well water at Goree, which the garrison and the inhabitants are obliged to make use of, is much more brackish, than that at Senegal, and that the scarcity of cattle on the opposite continent obliges them often to live on salt meat, for which reason Mr. BISHOPP (whom I have just now quoted) considers it, from his own experience, more unhealthy, than Senegal.

The air, notwithstanding its many noxious qualities during such a bad rainy season, as

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that in which this disease raged, does not appear to me to act so impetuously and violently on the body, as to induce me to take it for the immediate cause of the disease; but I only consider it as one of the worst predisposing causes*.

I think it is evident, from what has been said before, that the profuse sweats, the use of the brackish water, and the animal food without proper vegetables, produce during the preceding dry season a *dyscrasia* in the blood, whose pravity I believe particularly to consist in a preponderating acrimony of a putrescent nature. This acrimony I conceive to be aggravated and increased so rapidly, by the joint effects of heat and moisture during the succeeding rainy season, that the nervous system is suddenly affected by it, when the least occasional cause favours its action, and I believe, that its action on the nerves and their reaction produces

* On the second of September, 1778, a small sloop arrived from the West Indies at Senegal, the master and sailors of which remained free from the disease, though some officers and many soldiers of the garrison were seized with it after that date, and died. This, I think, shews, that the air was not the sole and immediate cause of it, or else those people could not have escaped; and it is also to be supposed, that they were not sufficiently predisposed, to be infected by contagion.

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the disease with all its horrid symptoms; wherefore, I consider this acrimony as the proximate cause.

Some celebrated physical authors maintain, that the acrimony, which manifests itself in fevers, is not to be taken as their cause, but as their effect; and they consider a debility of the body as their cause. With all due deference to those great men I cannot help differing with them in this opinion, in as much at least as it concerns this disease. I think, that if the increased motion of the blood in a fever is able to effect an acrimony, it is probable, that, besides other causes, the heat of the weather, which rarefies the fluids, and accelerates their circulation, may produce the same in a longer space of time. I do not mean to say, that a debility of the vascular system does not contribute towards the formation of the disease, for I am convinced of the contrary; but I consider it as a remote cause (as I have said before), and believe that the generation of acrimony depends in a manner on it. I am also fully persuaded, that this debility increases in most people with their years of residence in that climate, and produces bad effects in proportion; for which reason they are more subject to some

disorders, and have less chance of recovering from them, than fresh people from Europe, as has been observed by Mr. BISHOPP during his long experience in that country, who considers the common opinion of becoming seasoned to a bad climate, particularly such an one as that of Senegal, as very erroneous. Yet, notwithstanding all this, I think, that this debility, as the effect of the hot weather, may exist without doing much harm, whenever the generation of acrimony, as the cause of the disease, can be prevented by proper food and medicines*. The great degree of sudden debility and lassitude, which precedes our disease, is quite different from the former. It is generally but of a short duration, and in some pa-

* The following may serve as a proof of this: I have seen in the camps of the Moors old people, who from mere age were so weak, that they could not stir from the place, where they were lying, nor even get up to sit without help. They seemed hardly alive, and had not even power to speak aloud. Their bodies were nothing but skin and bones, and the veins, turgid from the heat of the weather, lay underneath the skin like so many ropes. I was told, that some of them had lived in that condition for ten years and upwards, that milk was their only food, and that, whenever the camp was shifted to another place, they were put on camels, and carried there.

tients it only takes place a few hours before the *rigor*. It seems to me to be the first effect, which the acrimony, as proximate cause, produces on the body, and I consider it, therefore, as the beginning of the disease, but not as its cause. Certain poisons, taken inwardly, are apt by their acrimony to produce debility, *rigor* and fever successively, whence it seems probable, that an acrimony, generated within the body, may do the same*. It also happens sometimes,

* There is a fish in the river Senegal, whose generic name is, according to LINNÆUS, *Tetraodon*, and its specific (if I am not mistaken) *Lagocephalus*. I have been told by the inhabitants, that this fish is good food, when caught up the river, and that it is used as such, but that it is poisonous, when taken in the mouth of of the river, or near the sea shore. It is probable, that those opposite qualities may be owing to the difference of food, which the fish lives upon. In the year 1775, in the month of May, four blacks, who were ignorant of this, had made a full meal on some of these fish, which they had taken near the mouth of the river. They were soon after seized with a yawning, weariness, and such a debility, that they were not able to stir from the ground, where they sat dining. As they were slaves, their master, as soon as he knew what had happened, sent for me. When I arrived, I found their pulse small and slow. They complained of great cold, and soon after they were seized with rigors, convulsions of the extremities, and *delirium*, shewing in the mean time

sometimes, that people, who feel a debility and lassitude of the body, are quickly restored by vomiting, purging, or sweat, and hence it seems, that the cause of this debility is thrown out of the body; otherwise I do not see, why those evacuations should have such an effect. It appears further to me, that a fever should always terminate in death, if debility is allowed to be its proximate cause; for the longer it

time an inclination to vomit. I gave them emetics, which they had not taken long, before they threw up a quantity of yellow tough matter, not unlike melted glue, intermixed with particles of the fish. Their pulse became now quick and full, a sweat broke out some time after, and stools succeeded. After this they fell into a sound sleep, from which they awaked almost restored, except that they were very weak, and hardly able to walk alone. I gave them nothing more, but a few doses of *theriaca* with Madeira wine, and they acquired their former strength gradually. One of them was worse than the rest. His jaw was slightly locked, and he swallowed the emetic with great difficulty. He was not able to walk until the third day after, owing to a small degree of *paralysis* in his legs, the consequence of the violent cramps, which went off gradually. He lifted, for instance, one of his legs to make a step forward, but instead of that, it went down again in the same place, from whence he had lifted it. Some of the blacks attributed the cause of his being worse, than the others, to his eating the roes of the fish, which they said were much more poisonous, than its fleshy substance.

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lasts, the weaker the body becomes, and of course the greater the cause of the fever, particularly when the moist and putrid *effluvia*, with which the air is impregnated, and which by every one is considered as one of the worst remote causes of fevers, still continues. This objection is removed by allowing an acrimony to be the proximate cause of our disease ; for whenever nature is able to free the body of it, or medicines are capable of correcting it, the fever ceases, though the debility should then be greater, than it was, when the fever first began.

Though there is a slight probability, that the first person, who was seized with the disease, had it by infection, yet as it remains uncertain, whether he really was infected or not, it is as probable, that he was taken with it spontaneously, and that an acrimony of a putrescent nature, generated within the body, and daily increased by the remote causes, might have been the cause of it ; the more so, as he had been under a course of mercury just before*. For it is evident, that as the contagion arises from the disease itself, so the disease must have been produced in the first instance, if not at Senegal, at least in Goree, by some other cause, than con-

* See the remarks to the journal on the weather.

tagion ; and this cause I believe to be such an
 acrimony. However, human contagion ap-
 peared to me to be the proximate cause in the
 greater part, and an innate acrimony only in a
 very few. The sudden effect, which the con-
 tagion produced on those bodies, who received
 it, makes me consider it, as a proximate and
 not as a remote cause. It attacked so indiscrimi-
 nately the strong and healthy people, as well
 as the weak, that if there had not been a proba-
 bility, that those seemingly healthy people, not-
 withstanding their looks, might be more or
 less predisposed to the disease by a lurking pu-
 trescent acrimony in the fluids, one might
 have been induced to believe, that no pre-
 disposition in the body was necessary to favour
 its action. The existence of predisposition,
 though not perceptible, is to be granted ac-
 cording to the well-founded rules, laid down
 in pathology, importing: that no proxi-
 mate cause, such as contagion, can produce a
 disease without predisposition ; and that no pre-
 disposing causes can do much injury to the
 body, unless a proximate one, such as acri-
 mony, arises from the effects of one or more of
 them ; or unless some other, such as contagion,
 supervenes. To make an application of this
 doctrine to the present case, I believe, that
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the constitution of some people may be strong enough to avert the effects of the predisponent causes, such as a sufficient accumulation of putrescent acrimony, fit to produce the disease; but not able to resist contagion. This is not unlikely; for if contagion acts like a ferment, as it probably does, it will suddenly infect such bodies, as are of the same nature with those, from whence the contagion proceeds, and which are as apt to undergo the same fermentation, though they are ever so little predisposed. It is, however, difficult to comprehend, how contagion is able to produce those corrupted and sharp humours, which are so copiously evacuated, in so short a time after it has taken place, particularly in those, who were seemingly very well, and did not shew the slightest predisposition before the infection. Yet, if it is considered, how rapidly the poisons of some reptiles run through the fluids, and corrupt them, when applied externally to the body by bite or otherwise, it becomes probable, that contagion may do the same; for though perhaps its mode of acting may be different from that of such poisons, yet its noxious quality of corrupting the fluids in a very short space of time, may, I think, be compared

to it*. However, when it infects strong constitutions, or such bodies as are not much predisposed to the disease, I believe from what I have experienced myself, and from what I have seen happen in a few others, that, notwithstanding its rapid action, it may be thrown off and overcome, either by the powers of na-

* Having mentioned the rapid action of poisons of reptiles, I take this opportunity of relating a very singular instance of it, which I was told by a credible mulattoe woman in Gambia: She sent early in the morning one of her slaves to a neighbouring forest to cut some firewood. The man had hardly been gone a quarter of an hour, when he came running back with the most frightful appearance. The blood ran forth from his ears, nose, mouth and bladder. His stools were bloody, and attended with the most excruciating gripings. The woman, surprized at this sudden change, asked him the cause of it. The agonizing man shewed her a small wound in his foot, and said, That while he was going to the forest, he put his foot unknowingly on a snake, which lay hid in the grass, in consequence of which the snake had bit him in his heel. That he knew from the species of snake, that its bite would be mortal, and that death itself would soon follow, for which reason he had run home as fast as he had been able, to die among his friends, which, according to the woman, happened about an hour after. I never saw this species of snake, but from the description, which the blacks give of it, it is about two feet long, and of a blackish colour.

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ture alone, or assisted by medicines. But I have also observed, that when this did not take place, the robust and strong died generally quicker, than the weak.

It has been questioned, whether those dreadful tempests, called *tornados*, did in any measure contribute to produce the sickness prevailing at those times, because it had been observed, that in the beginning of the rainy season a great number of people were taken ill on a certain night, succeeding one of those *tornados*.* I have observed, that those, who were exposed to their fury, were often soon after taken ill, but I do not, therefore, think, that they are impregnated with any particular noxious vapour, as I have known people imagine. For if they were, it would follow, that the air in general must be infected by them, which does not appear. Those Europeans, who according to the custom of the inhabitants, avoid their first impulse, by shutting the doors and windows of their rooms, rarely feel any immediate bad effect of them. Neither do I see any necessity, why they should be ac-

* See Doctor LIND's, essay on diseases incidental to Europeans in hot climates.

cused of containing such noxious vapours, when the many other causes seem fully sufficient to produce fevers at this time. The experienced Europeans are so far from believing them hurtful, that when the sky is covered with clouds, and the weather disagreeably calm, they often wish for them, in order that the air may be refreshed and ventilated, but they take proper care not to be exposed to their first shock. The soldiers, however, have not the convenience of taking care of themselves. Many of them lie together in the same barracks, of which they leave the doors and windows open, to procure fresh air, when, therefore, a *tornado* comes on in the night, they get up, perhaps quite naked, and in a full perspiration, to shut them, and are thus exposed to its greatest fury. To avoid the swarms of musketos in the barracks, they also lie down often to sleep in the night on the bastions or on the flat roofs of the officers quarters, where they are not seldom overtaken by *tornados*; and they are besides exposed to them, when they are standing centry. Now, as *tornados* occasion such a cold air, as to make the mercury in the thermometer fall almost instantaneously seven or eight degrees, they must have a sudden and sensible effect on those, who
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are exposed to them, but particularly on those, whose fluids are in so bad a state, as to require only the least additional external injury to cause a fever. I think, therefore, that the immediate action of *tornados* on such predisposed bodies may be considered as the occasional cause of those fevers, which often take place soon after.

It remains now, that I should say something on the cure of the disease. I shall, therefore, make an attempt, though, having intimated before, that the greatest part of the patients died, and that a few only recovered, I apprehend that the different modes of treatment, pursued without success, may appear of very little consequence. However, as many of those medicines, which prove generally successful in other fevers, were of no service in this disease, I think, it will not be amiss to point them out, and also those few, which I found by experience to have in some small degree a salutary effect.

That the bad success attending the cure of the disease may not be attributed to neglect, or a want of attention, occasioned by an apprehension of being infected, I must take notice

tice here, that the patients in general were regularly attended twice or three times a day, or as often as occasion required by Mr. BISHOPP, who, besides the greatest share of theoretical knowledge of physic, has been enabled by his long residence in that country, to acquire by long experience the best practical intelligence of most diseases peculiar to it, and whose skill in treating them, though it proved ineffectual in the present case, can be attested by a great many living witnesses, who have themselves experienced it*. I can say in my own behalf, that I was always among the sick, and that the danger of being infected did not prevent me from attending them constantly; nor had I the least opportunity, if I had found an inclination (which I did not), to imitate the precedent given by the celebrated Doctor SYDENHAM, (who absented himself from London, at the time the plague raged there) but was obliged to attend to my duty. I may add, that I left nothing untried, that either reason or experience could suggest; but the inconceivable malignity of the disease frustrated every advice, and overcame almost every medicine, and

* Non est in medico semper, relevetur ut æger:
Interdum docta plus valet arte malum.

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seemed

seemed to require a second *ÆSCULAPIUS* to prevent its fatal termination*.

In order to restore the patient to health, whether he got the disease spontaneously or by infection, it seems necessary, that the acrimony of the fluids, which I have adopted as the proximate cause in the first instance, and which I consider to be the sudden production of contagion in the second, should be corrected.

A physical correction I suppose to be an action, by which the matter to be corrected, is changed in such a manner, as to lose its noxious quality, and become milder, or at least less hurtful. But there are only two ways, according to the rules of chemistry, by which a matter can be changed: The one is by depriving it of one or more of its constituent principles, and the other by mixing and incorporating with it some other substance of a different nature. To obtain, therefore, this end, it seems requisite, that the one or the other of

* Scilicet utilium *medicina* scientia rerum,
Promittit, quam sæpe nequit præstare, salutem,
Et voluisse sat est ; —————

HEBENSTREIT de antiq. med. carn.

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these processes should take place in the fluids of the patient.

Nature is the most powerful agent in the first mode of correction, and does not seldom, without any assistance, separate the acrid, noxious and morbid matter from the rest of the fluids, and throw it out of the body by sweats, vomitings, stools, and other means. But it also too often happens, that nature alone is not able to perform this task, but requires assistance. In this case it has been advised, to administer only such medicines, as are adapted to facilitate her endeavours, and calculated to assist in throwing off the morbid matter by those outlets and means, which are pointed out by her, if they are found convenient*.

The bile, which nature in the first onset of this disease endeavours to throw off by vomiting, seems to indicate emetics; and they appear to be the more necessary in some patients, the more unsuccessful the endeavours of nature seem to be. They were, therefore, when the disease first began to rage, exhibited in

* Quæ ducere oportet, quo maxime vergant, eo ducenda, per loca convenientia. HIPPOCRAT. Aphorism. 21. sect. i.

different doses and of different kinds, with a view to assist nature, and with a hope, that the retching would cease and an intermission of the fever take place after their operation, as commonly happens in those bilious fevers, which generally are at that time of the year, when the rains fall with moderation, the common endemic diseases of that country; but the contrary mostly happened. The convulsive motions of the stomach did not cease after the usual time allotted to the operation of emetics. The bile continued to be most abundantly secreted, and its natural colour was gradually changed into a dark one. I found by experience, that the *viscera* concerned in this preternatural excretion, were not able to support such a violent action for a long time without much injury, and I saw plainly, that Nature, instead of being assisted in her attempts by emetics, was to be checked, if possible. For the stomach being in a manner racked by the violent and repeated retching, became very much inflamed, and I believe, that the liver was soon after affected in the same manner. The symptoms, which induced me to believe, that an inflammation had taken place in both, were the pain and the burning heat, which the patients complained of in the region of those *viscera*, as also the un-

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quenchable

quenchable thirst, the continual *singultus*, &c. I also believe, that the bile became darker in the same degree, as the inflammation of the liver proceeded; for it is probable, that an inflamed liver is not able to perform its office properly, and that some red blood might enter together and promiscuously with the ill-formed bile into the biliary ducts, and give it in proportion, as it was mixed with a more or less quantity of it, a more or less dark colour. I suppose further, that the bile, thus conditioned, is coagulated in the stomach or in the intestines by the gastric juices, or perhaps by the acid drink, which the patients made use of, as it always appeared grumous or in small lumps, floating in the liquids, with which it was thrown up, or carried off by stools towards the latter end.

During the vomiting, or soon after a violent fit of it, the sweat sometimes flowed profusely. It was of the best consequence, when it happened with moderation in the beginning, before the liver was inflamed, and when a remission of the fever as well as a cessation of the vomiting took place in the mean time, or after it; but this was but seldom the case. In most patients it afforded no ease, and while it flowed,

flowed, neither the fever nor the vomiting abated. It was, therefore, not to be expected, that Nature would free the body by this means of the morbid matter, but it was rather a sign of her being wearied and exhausted. Neither was there any hope, that Nature would be able to free the body of the morbid matter, by any other secretion. The symptoms became gradually worse. The inflammation of the liver, of the stomach, and perhaps of the intestines, was changed into a gangrene, and this was followed by an incipient putrefaction of the whole body, and death.

Nature, therefore, not being able, either alone or assisted by medicines, to separate the acrimony from the rest of the fluids, and throw it out of the body, without producing in the mean time local diseases of the most fatal consequence in those *viscera*, which were particularly concerned in this work, it seemed necessary, to pursue the other mode of correction, and try, if the acrid fluids could not be changed for the better by mixing and incorporating with them some substances of a different nature. But as our senses are not acute enough to determine the particular nature of acrimonies, generated in the fluids, and as for some the reason we

are not able to judge what medicines are best adapted to correct them, we are obliged to learn from experience, which of them will answer the purpose, unless the salutary effect of some has already been experienced, and their virtue established by repeated trials in some analogous diseases.

Among the remedies, whose virtues have been experienced in fevers of a putrid tendency, the bark stands in the first rank. It has generally been given with good success, and we all know at present, that it has not only the power of resisting putridity, but also that of strengthening the solids. It is supposed, that it produces the first by correcting the fluids, and that the latter is the effect of that correction; for the fluids being corrected, the solids must of course be mended. However, there are many opinions about this matter, and some maintain, that the solids alone are strengthened by it, and that they are enabled by those means to subdue the noxious quality of the fluids. I think, it is most probable, that it acts both on the fluids and solids, and that it answers both ends in the mean time. However, let it be as it may, it is a powerful corrector in one of these ways, or in both,

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and I am convinced from experience, that it produced the best effects in our disease, and that it should be given as soon as possible. But there were two obstacles, the one of which forbid its administration, and the other prevented its effects; I mean the uninterrupted continuation of the fever, and the continual vomiting.

It has been experienced by many, and I have seen it myself, that the bark, when given in the paroxysm of a fever, will often cause obstructions in the *viscera*, but particularly in the liver and spleen, and that those obstructions very often terminate in fatal suppuration, dropsies, and other chronical diseases*. It has, therefore, been advised by clinical authors, not to give the bark, but during the intermission, or at least the remission, of a fever. The advice is excellent; but this disease was so very

* It is to be observed, that the *ascites* as well as the *anasarca* are rare diseases at Senegal, and when they happen, the patients are not able to endure or bear them for a long time, but soon fall a victim to the disease. The heat of the weather, which excites sweat and perspiration, and thereby prevents the accumulation of waters in the body, seems to be the cause of its rarity, and the same heat, by forwarding the putrefaction of the stagnating waters, when there are any, accelerates death.

violent,

violent, that in most patients the fever did neither intermit, nor remit, and it would have been in vain to wait for such an opportunity ; for the patient would have been carried off, before either of them happened. There being, therefore, in this case two evils, in avoiding one of which, we are subjected to a worse, it is but reasonable, that we should prefer that, which does the least harm, and, therefore, the bark must be given in the fever.

But the continual vomiting is another obstacle to the administration of the bark. Its effect is thereby prevented ; for no sooner is it given in any form whatever, but it is thrown up again immediately. This was not only the case with the bark, but with all other medicines. Many of them were tried with a view to cool the body, and bring on an intermission of the fever, such as nitrous potions, saline mixtures, camphor juleps, and others, which are recommended for that purpose, but they were all rendered ineffectual by the vomiting. I tried to cure this horrid symptom with salt of wormwood, dissolved in a small quantity of water, saturated with lime juice, and given in the state of effervescence, which remedy has been proposed as almost infallible in that case ; but it proved ineffectual. I gave some drops of oil of pepper-
mint,

permint, made into a draught with sugar and water, to no purpose, and I tried many other medicines with the same ill success. I also found by experience, that it would not cease spontaneously, until the powers of nature were entirely exhausted, and then a troublesome *singultus* took place, which remained almost to the moment of death. Yet, before any thing could be attempted in the cure of the disease, it was absolutely necessary to remove this symptom, if possible. But as it seemed to be produced by the disease, as its immediate cause, this could not be effected without removing the former. There is, however, one medicine (I mean *opium*) which, though it has no power of removing the cause of the disease, is endowed with a particular virtue of causing such a diminution of sensation and irritability of the nerves, as to produce by this means a cessation of the convulsive motions of the stomach, and its adjacent parts, and render nature in a manner inactive, while its effects last, by which means an opportunity presents itself to give such remedies, as are calculated for the cure of the disease itself. *Opium*, therefore, or *laudanum* (which being in a liquid state answers rather better) is to be given in proper doses, and they are to be repeated as often, as they

they are thrown up again, until the vomiting ceases. As soon as this is obtained, the bark is to be given immediately, and to prevent a return of the vomiting, *laudanum* is to be joined with it occasionally. After the stomach seems to be entirely settled, the bark or its tinctures (among which that of HUXHAM deserves the preference) are to be given in proper vehicles without *laudanum*. Great care is to be taken in the meantime, that the secreted bile, and perhaps other accumulated morbid humours are not detained in the intestines. If Nature, therefore, should be slow in evacuating them the natural way, she is to be assisted by proper remedies. But that the stomach may not be irritated anew by stimulating medicines, and that the acrid bile, when poured into the *duodenum*, may be drawn downwards, this is best effected by clysters. However, when every thing goes on favourably, and the stomach has been at ease for some days, a laxative of manna, rhubarb, and cream of tartar, or the like may be given. The drink during the fever should be cooling, and such as experience has proved to be antiseptic. Barley-water, with the rob of lemons or their juice, sweetened with a sufficient quantity of sugar or honey, is very proper. But as soon as the fever is conquered,

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the patient should take now and then a glass of wine, but particularly Rhenish, if it is to be had, and some proper food to support his strength*. Wine becomes at this period an excellent medicine; though I found it (except perhaps Rhenish) do much harm during the fever†. The best food, at the same time, is such, as is not only of easy digestion, but also able to strengthen the body, and to contribute towards mending the ill state of the blood. But as there is not a great choice of food at Senegal, either thick water gruel, diluted with a good quantity of Rhenish wine, and sweetened with a sufficient proportion of sugar, or some gruels of Guinea corn, which the natives prepare very well, with the addition of those two articles, may answer the purpose.

* In morbo, qui plus virium aufert, celerius cibus dandus est: itemque eo coelo, quo magis digerit. Ob quam causam in Africa nullo die æger abstinere recte videtur. CELSUS. Lib. 3. cap. iv.

† Two or three soldiers had saved before their illness their rations of Teneriffa wine, which consists in a pint daily, and laid up about a gallon or more of it. Of this, mixed with a sufficient quantity of water, they made use during the fever as common drink, and they were indulged in it, to see what effect it might have, but it aggravated the symptoms and accelerated death.

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Though I recommend this method of cure as the most effectual, and though I would pursue it, if I was ever to find myself in the predicament again, yet I have not sufficient proofs or experience of its efficacy, to prompt me to have an entire reliance on its future success in the like cases. I found it succeed in two patients, but I also saw it fail in one. The last, however, was quite exhausted by the vomiting, before I gave him the *laudanum*. It was on the third day of his being taken ill; and after it had put a stop to the vomiting as well as the *singultus*, I gave him the bark. On the fourth and fifth day his body, but particularly his face, began to swell in such a manner, that his eyes became quite closed by it, and the breast turned of a yellow, green and blue colour. He resembled a corpse in the highest degree of putrefaction, in which the air has begun to disengage itself and puff up the skin, a circumstance which I had not observed in any other patient. On the sixth day a *singultus*, or rather a belching, took place again, and he expired on the seventh.

At the time when I found this method succeed in the two abovementioned patients, the ravage of the disease had much abated, and I
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had, therefore, no opportunity of ascertaining its good effects by repeated trials; nor do I know for this reason, whether the success is to be ascribed to this mode of treatment, or perhaps to a wholesome change taking place in the air.

I do not, however, think myself very blameable, that I did not administer the *laudanum* sooner. For what can a young practitioner do better, than follow the rules and precepts laid down by celebrated clinical authors? The disease besides was so acute, that there was no time left for deliberating or changing the medicines, but the death of the patients anticipated me in this, which, according to *CELSUS*, greatly lessens the blame of the physician*. In the beginning of the fever cooling medicines and bleeding seemed to be required; the presence of bile indicated emetics, and some other symptoms other remedies. These were, therefore, exhibited, but without success. To mitigate afterwards the convulsive motions of

* *Magis tamen ignoscendum medico est parum proficienti in acutis morbis, quam in longis. Hic enim breve spatium est, intra quod, si quod auxilium non profuit, æger extinguitur. Lib. 3. cap. i.*

the stomach, camphor, musk and many other medicines (as I have already mentioned) were tried in vain. *Opium* I was prevented from giving by those cautions, which are met with in the writings of many eminent authors, as preventing Nature in its operations and putting a stop to its salutary intentions*. At last, however, when I found every other remedy fail, and the retching the worst symptom and the most difficult to be overcome, I ventured to give it, and with the success, which I have related.

* Quamvis enim febre vigente, quæ *ναρκωσις* vi prædita sunt non omnino profint, neque destinatum a medico scopum feriant; tamen opportune, et in declinatione morbi adhibita, præclaros effectus edunt: antea vero prodesse non possunt, partim quia fermentationem vi atque impetu procurrentem sistere nequeunt, partim vero (quod quidem majoris adhuc momenti est) materiæ peccanti tunc temporis massæ sanguineæ, æqualiter admistæ, neque versus separationem adhuc vergenti, ab exhibito hujusmodi medicamento manus injicitur, adeoque depuratio illa tantopere expetenda impeditur. Opera SYDENHAMI. sect. 1. cap. iv. de febre continua.

Opiata et leniora, quibus spasmus coercetur, hoc in casu summa cum cautela propinanda sunt, ne motus coctioni conveniens supprimatur. LUDWIG institutiones medicinæ clinicæ de febre catarrhali maligna.

Since

Since that time I am induced to think, that the virtue of the bark is rather increased in some respects, than decreased by the addition of *opium*. For I have observed, that the bark very often stops all perspiration, when it is given by itself, but that it promotes it to the greatest benefit of the patient, when it is joined with a small dose of *opium*. The good success with which the bark joined with *opium* has been given in the mortification of the toes, and in which the bark alone has very often failed, proves also that its antiseptic power must rather be augmented than diminished by the addition of *opium**. I also find, that *opium* has been given with success, and almost in the same manner, as I have proposed it, in the yellow fever, which sometimes rages so severely in the West Indies, and in which the vomiting is one of the worst symptoms; but this unfortunately I did not know at that time†.

I think it hardly necessary to point out, what the convalescents should observe; for it is ob-

* POTT on mortification of the toes and feet.

† See some extracts from the writings of Doctor BRUCE in Doctor LINN's essay on diseases incidental to Europeans in hot climates.

vious, that they should be very careful in their victuals, and that in order to recruit their strength, and correct the putrescent state of the fluids, they should continue for a while to take proper cordials and antiseptic medicines, among which the stomachic tincture, or HUXHAM'S tincture of bark, and a good glass of wine, particularly Rhenish, are preferable to any others. They are also to take care, that the apartments, in which they live and sleep, are kept dry with fires, and that they do not walk out too soon into the open air. By using these precautions, they will both prevent a relapse and the scurvy.

Having thus far spoken of those patients only in which the vomiting began with the fever, and increased during the first two or three days, and having pointed out, with some little probability, a successful mode of treating them, I shall now briefly take notice of those patients, who had in the beginning only a trifling sickness at the stomach, attended with a dull and burning pain in its region, but were on the second or third day seized all on a sudden with the most dreadful convulsions, vomiting and purging, which in a few hours terminated in death. I wish I could propose the least probable

bable mode of treatment to prevent this horrid scene, but I must confess, that all the means, which were tried, proved unsuccessful, and that I do not know of any. I suppose, that an inflammation of the liver, which was partly the consequence of the continual vomiting in the other patients, originally took place in these with the beginning of the fever. Their pulse was generally hard, full and quick. They shewed signs of great anxiety and restlessness, by having their beds often shifted from one place to another, and by quitting them now and then and walking about the room. Their skin was commonly dry except about the face and neck, where a little sweat sometimes appeared. Their urine was generally suppressed, and they were bound, but they broke much wind upwards and downwards. Bleeding, which was here indicated, did more harm than good by promoting the convulsions and the vomiting of that black matter, which I have called black bile, and which I have described before. A soldier with the above symptoms, and who had no vomiting, was bled on the second day of his illness; he fainted during the operation, and was immediately seized with vomiting and convulsions, which carried him off in a few hours. *Spiritus minde-*
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téri, with a warm infusion of balm, camphor, and many other medicines were given to some others, with a view to promote sweat, but all in vain. I dreaded to give emetics and purgatives in the beginning, fearing, not without reason, that they might provoke and induce a continual vomiting. Weak clysters were of no use, and when they were composed of stimulating ingredients, they were of the worst consequence; for by the irritation of these the matter was put in motion and poured into the *duodenum*, which, instead of proving salutary; by being gradually evacuated by stools, caused immediate convulsions, vomiting and purging; with a deprivation of all senses. The convulsions sometimes abated a little time after; and the patient, though he did not recover his senses, seemed composed, but they were suddenly repeated with more fury; the pulse began to flutter and death ensued.

Having just now mentioned bleeding as proving hurtful in those cases, where there was no vomiting, and that it seemed to promote the convulsions, I think it will not be improper to observe here, that I found it in most patients do more harm than good throughout every stage of the disease. For though it was indicated

indicated by the full and often hard pulse, and by the strength of the arterial system in general, I found by experience, that those symptoms were fallacious and deceiving; for after bleeding the pulse sunk generally so low, that it could not be raised again by the most powerful cordials. The few patients who were bled, and in whom it seemed to be strongly indicated, died, except one, in whom the whole disease appeared to throw itself on the lungs, which having undergone a most violent suppuration, he, after a long lingering, began to recover slowly. The taking away of small quantities of blood had almost the same bad effect, as moderate bleedings; for when I saw the salutary effect, which the bleeding at the nose produced in those two patients, whose cases I have before related, I tried them, thinking that the works of Nature might be imitated by small and repeated bleedings, but I was frustrated in my expectations, and soon convinced of what has been often confirmed by experience, that the excretions produced by Nature, and their effects on the body, are very often widely different from those procured by art. I must further observe on bleeding, that it is to be supposed, and indeed I partly know it, that the French surgeon's (who have a custom

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of bleeding in most fevers of a continued form) were not behind hand in this disease, which raged at Goree, then in the hands of that nation, about the same time. But they were, perhaps on that account, rather less successful, than we were; for it was reported at that time, that they had lost more people in proportion, than we had.

Blisters also did more harm than good. Not one, as far as I know, who had them applied, recovered of the disease, and I think I can in some measure account for their bad effect: It is well known, that *cantharides* contain an acrid resinous substance, abounding with a principle of a saline nature, by the action of which, they are enabled to blister the skin*. But while they are doing this, some of this acrid and stimulating substance, (perhaps the saline principle) is taken in by the absorbents of the skin, and carried into the circulation. That this is the case, I think, is manifest from the

* In parte resinosa, etiamsi minima quantitate inhæreat (scilicet cantharidibus), acredo caustica et virtus unice propemodum quærenda est, eademque implicito *principio salino* valde turgida reperitur. *Fundamenta materiæ medicæ*. FRID. CARTHEUSER. Tom. I. sect. x. cap. xiii.

alteration, which they produce in the pulse, and from the pain, with which the bladder and the vessels, which serve in the secretion as well as the excretion of urine, are more specifically affected. Those absorbed particles, of whatever nature they may be, contribute, without doubt, towards the dissolution of the blood, particularly in such bodies, as have already a tendency to putrefaction ; for if we observe the effects, which they have, when taken inwardly, we may be almost convinced of it. They stimulate and irritate the nerves most surprizingly ; they increase and accelerate the pulse to the utmost degree, and they rarefy the fluids beyond measure, in consequence of which the solids are also preternaturally extended, and dilated to such a degree, as to be unable to recover their proper elasticity. An instance of this kind happened, when I was at Paris : A nobleman of a strong and robust constitution, not content with his natural abilities in the execution of the duty of love, took a small dose of *cantharides* in powder previous to going to bed with a certain woman, in order to acquit himself to her satisfaction. That they had the desired effect is not to be doubted ; for the woman was said not to be able to stir the next day on account of great pain in the loins and *pudenda*,

occasioned by fatigue and excoriation. The man was immediately after seized with a fever of a continued form, attended with symptoms of putridity, of which he died a few days after. It may perhaps be said, that debility, occasioned by the too often repeated *coitus*, was the cause of this disease. I allow, that it may have contributed towards it, but I dare say, that the same disease would have been the consequence in some degree, if he had been prevented from lying with any woman, and that the cause of it, as the immediate effect of the *cantharides*, was a dissolution of the blood and a preternatural distention of the arteries; for at the opening of his body the latter were found very much dilated, and the heart nearly twice the size of an ordinary one. A similar increase or augmentation of the heart and other *viscera* has generally been found in those, who die of the plague, scurvy, and other putrid diseases, and as *cantharides* are able to produce diseases with the same effect, I think, one may reason from this by analogy, and say, that such diseases, as have a tendency to putrefaction, like that, which I am treating of, cannot but be aggravated by the application of blisters, on account of the absorption, which takes place. But to this bad effect of the blisters acceded another

another one of no less injury. The sores, occasioned by them, became very soon gangrenous, which to prevent every remedy proved ineffectual, and they emitted such a stench, that the person, who dressed them, stood the greatest risk of being immediately infected, of which I have related one particular instance in the remarks, prefixed to the meteorological journal.

I have not opened any of the bodies of the deceased. The reason, why not, may easily be guessed. They were generally so putrid, that they could not have been opened without the greatest danger of becoming infected by the putrid smell. We were obliged to bury those, who died about seven or eight o'clock in the evening, by the light of lanthorn that very night; for if they had been kept unburied till next morning no living person could have approached them, on account of the putrid smell. I, therefore, think myself fully exculpated from having neglected it, and indeed I must confess, that I was glad to escape the contagion as long as I did, and took care not to expose myself to it by dissection.

Having now acquitted myself of the proposed task, as well as my abilities would permit,

mit, I think it will not be amiss to subjoin some few observations on prophylactics, or on such medicines and other means as may contribute towards the prevention of the disease; for though, on account of its seemingly indiscriminate ravage, there is not much faith to be placed in them, yet, believing I received some little benefit from them in my own case, I can not take upon me to say, that they are entirely useless.

To prevent the disease, it seems necessary, that the ill effects of the predisponent causes should be prevented, the principal of which are : the noxious quality of the fluids and the relaxation of the solids. The bark would seem a proper remedy in both cases, but it very often happens, that it stops all perspiration, and causes costiveness. It sometimes occasions a disagreeable heat in the body, and not seldom headaches. It also often produces painful boils on the skin, attended with much inflammation, in consequence of which bad qualities I have often seen it create fevers instead of preventing them. This effect, so different from what it generally produces, when given in fevers, I conceive to be owing to the want of those critical evacuations, which, either pro-

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moted by nature alone, or assisted by art, commonly take place in the latter case previously to its administration. The bark, therefore, not answering the end, some other remedy, which may be endowed with the same virtues, and not attended with the same ill qualities, is to be sought after. This I think may be found in some degree in the *sarsaparilla*, the decoction of which I have experienced myself to be of much more service, than the bark. It promotes not only perspiration, but also the secretion of urine; it resolves obstructions of the viscera and glands; it corrects the acrimony of the blood, and I cannot but believe, that it strengthens in some degree the solids of the whole body. It also acts without much *stimulus*, and almost imperceptibly on the body, on which account it is also preferable to other more powerful medicines, which very often by disturbing the œconomy of the system induce diseases, instead of preventing them. Though it can hardly be demonstrated by a chymical *analysis*, on what principles its great virtues depend*, experience has taught us, that it is endowed with them, and they are no where

* See *Fundamenta Medicæ*, FRID. CAR-
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more conspicuous, than in those venereal patients, who after having been reduced and emaciated by the use of mercury, are by the decoction of *sarsaparilla* restored almost to their former health. The blood in those patients is in some degree dissolved, and their solids are relaxed. Their habit, therefore, partly agrees with that, which I have supposed to be able to produce our disease spontaneously, or without any previous contagion. It is, therefore, no wonder, that those persons should first have been seized with the disease, who had just before been, or were then under a course of mercury for venereal complaints, as I have related in the remarks to the journal of the weather.

I am also of opinion, that the *sarsaparilla*, besides the aforementioned virtues, is endowed with a power of resisting contagion, and I believe I experienced it myself in some degree; though perhaps this power may be nothing else but the result of its good effect on the fluids. This opinion, however, is not new, nor is it my own only. DIOSCORIDES tells us; that the action of poisons may be prevented by the leaves and stones of the berries of *sarsaparilla*.

*rilla**. If this is the case, there is some reason to suppose, that its root, whose virtue was perhaps unknown to DIOSCORIDES, may be endowed with the same power, and capable of preventing contagion, which may be considered as a poison. I am rather inclined to believe, that the root surpasses the leaves and the stones of the berries in virtue, or else I do not see, why these should have come into disuse, and their place be supplied by the root.

I would, therefore, advise those, who reside in such climates, as that of Senegal, to begin to drink the decoction of *sarsaparilla* a few weeks before the rains set in, and to continue it during the whole time, they last. I do not promise, that it will infallibly preserve their health, because I have myself experienced its failure, as I shall soon have occasion to relate; but I believe, that it will greatly contribute towards it. An ounce of the root boiled in a

* Folia et acini smilacis asperæ (*sarsaparillæ*), et ante et post epoti, venenosorum antidota sunt. Tradunt si infantibus, nuper in lucem editis, quid ex his tritum propinetur, nulla postmodum venena nocitura. Inciditur etiam ad alexipharmaca, id est ad ea medicamenta, quibus venena arcentur. PEDACIUS DIOSCORIDES de smilace aspera.

quart of water, reduced to a pint, the one half taken in the morning and the other in the evening, will be sufficient. Great care is to be taken in the mean time, that the digestion is duly performed; for though I do not believe, that the decoction of *sarsaparilla* weakens the stomach (of which ill quality it stands accused*), but am rather of a contrary opinion, yet, it will be well to avoid all sorts of food of difficult digestion; and in order to assist the stomach in doing its office properly, to clear the intestines, and to forward the excretion of bile, it will not be amiss to take a small dose of rhubarb now and then. But above all I would advise a glass of good wine at dinner, as nothing in my opinion contributes more towards the support of the strength of the whole system. A glass of punch, particularly that which is made with the acid of tamarinds, instead of that of lemons, is also beneficial. Rhenish wine with Pyrmont water and a little sugar is a very wholesome and refreshing drink between

* Ventriculo noxia est (*sarsaparilla*). CÆSALPIN. Art. Med. Lib. iv. de morbo gallico; and the same author says in the xxvii. chapter of the fifth book, de plantis: Quidam cum vino eundem pulverem (scilicet *sarsaparillæ*) exhibent; sic enim ventriculum minus dissolvit.

meals, but as it is costly, it is not adapted to every one. A glass of porter may be taken at meals, but for common drink it is too heavy. I have found it, however, of the greatest service to convalescents. Intemperance in eating, drinking and venery, but particularly hard labour and strong exercise are to be carefully avoided. The profuse sweats, which those two last occasion, do not fail of producing imperceptibly a *dyscrasia* in the blood and weakness in the solids. I have often observed, that blacksmiths, riggers, and other hard-working people, who had exerted themselves in working at their different trades, during the dry season, were seized with very malignant fevers the succeeding rainy one, and carried off. They do, however, not feel the least inconvenience from the hard labour, at the time they are performing it, but enjoy the best health, and when they are advised not to exert themselves too much, they sometimes laugh at it, and answer, that they replace the water, which they sweat out, by the drinking of wine and punch, and that they never felt themselves better in all their life time, but the next rainy season convinces them too late of their error.

From my own experience I believe that wine has in some degree a power of expelling

a newly-received infection, or at least of contributing towards its expulsion. For after I had preserved my health with much care, and as I believe by the use of the decoction of *sarsaparilla*, I was at last infected by contagion. I think, that I caught it from the Governor*, to whose breath I had been too nearly exposed, the day before he died; for while he was speaking very inarticulately, and in a low tone, I was obliged to approach my face very near to his, in order to understand what he said; and that I might not increase his uneasiness, I omitted using my smelling bottle, which I otherwise always did, and the contents of which I shall indicate hereafter. When I went away from him, I found myself chilly, and in a few hours after I had a slight shivering. I was sick at the stomach; my head ached, and all my limbs felt as if fatigued from hard work. In this condition, I hardly knew what to do first. The sickness at the stomach indicated an emetic, but I was afraid of taking one, because I had seen it induce a continual vomiting in

* Governor CLARKE lived very regular in every respect; he took the tincture of bark and bitters three times a day, and used every other precaution to avert the disease, but ineffectually.

others. Consulting, therefore, with myself, what I should take, I thought, that such a remedy might answer best, which with the assistance of Nature might expell the received contagion by the outlets of the skin. To obtain this end, I mixed six ounces of the decoction of *sarsaparilla* with six ounces of good Teneriffa wine, and had it warmed on the fire. In the mean time, as the air was very damp, I had the bed thoroughly dried, by putting a copper pan full of red burning coals within its pavillon, which being done I took the aforesaid warm mixture, and went to bed, which was about nine o'clock in the evening. I soon after felt myself very hot; my pulse became full and very quick, and my skin was quite dry. About midnight I vomited spontaneously, but there was no bile in what I brought up. After this the fever decreased gradually, and a copious sweat ensued, which ceasing to flow about four o'clock in the morning, I had a clyster of water, sugar, and common salt injected, which caused three or four motions. About eight in the forenoon I got out of bed, and feeling myself very weak, I took some water gruel with a little wine. I drank a tumbler full of the decoction of *sarsaparilla* every three hours during that day; and as the
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Ver did not return in the evening; I walked out the next day in the execution of my office.

It may perhaps be questioned here; whether the good success in the present case is to be ascribed to the wine or to the *sarsaparilla*? I for my part think, that it is to be rather attributed to the latter than the former, though I believe at the same time, that the virtue of the *sarsaparilla* is much increased by the addition of wine; for the latter has not only the power of strengthening, but also of stimulating the whole system, whereby it assists and enables Nature to subdue the contagion, which the *sarsaparilla* of itself would be insufficient to effect. It is; therefore, probable, that neither the one nor the other would by itself have effected, what they did jointly. The weather also, which had then begun to change for the better, may perhaps have had a great share in it.

Though I have said so much in praise of wine, and recommended it so strongly, yet, as the only European, who escaped this disease entirely did not make the least use of any spirituous liquor, I would confine my advice to such persons only, as are accustomed to it. The person in question, who affords this very striking exception, is a Mr. HARE, master of a merchant ship,

ship, who had been at Senegal backwards and forwards for several times, but was residing there, at the time the disease raged, and for two years before. He was more exposed to the infection, than many others, for he lived in the house of that dreadful-looking patient, who was swelled and puffed up, before he died, like a putrid corpse, as I have related before. He also waited on him out of humanity day and night, because the blacks were afraid of going near him, on account of his most dreadful appearance. He never drank a drop of any spirituous liquor, not even beer or cyder, and he told me, that he had not for ten years past, but that he had made use of it before that time. His only drink at meals was water, and plenty of tea and coffee in the morning and afternoon. He made not the least use of tobacco in any form, and took no precaution whatever to prevent the infection.

Notwithstanding this remarkable exception to one of my proposed prophylactics, I shall proceed to recommend some others, partly founded on reason and partly on experience: As the rains and the southerly winds render the air exceedingly damp, it cannot but be very pernicious to sleep open and exposed to it; this
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is, therefore, to be carefully avoided. To prevent its dampness in the apartments, it will be proper, notwithstanding the heat of the weather, to keep continual fires in them ; for they increase the heat so little, that it is hardly perceptible, and still they keep the rooms dry, and contribute also towards the circulation of the air. The blacks on the island and on the continent observe this very strictly. They always have at this time of the year a wood fire lighted in the centre of the floor of their huts, which being unprovided with chimnies, the heat and smoke of the fire pervade the whole. By this means the air is not only dried, but the greatest of all plagues, I mean the musketos, which can hardly endure smoke, are also partly kept off.

As bathing is a means of keeping the skin clean, which during the rainy season must be beneficial to the body by facilitating perspiration, I would recommend it now and then for that purpose ; but then it should be done in a tub, filled with well water, placed in a dry room near a fire. I recommend it only now and then, because I cannot say much in praise of its daily use. Those who made use of it with a view of bracing the solids, I found
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were as liable to the then raging diseases, as others, who did not practise it, which strengthens me in my opinion, that the diseases are more owing to a noxious quality of the fluids, than to a relaxation of the solids. I advise bathing in a room, because I consider the being exposed naked to the open air at this time as very pernicious. I have known fevers to be the immediate consequence of bathing in the river at this time of the year, which I rather attribute to the being exposed to the air, than to the quality of the river water, as it has not the same effect on the blacks, from being accustomed to go partly naked. During the dry season bathing is very refreshing and comfortable, and it may be practised daily either in the river or in the sea without any precaution, except that of not doing it, when the sun is in or near the meridian, but in the morning or evening.

Contagion being more virulent in the vicinity of the body, from which it exhales, than at a distance from it; and also of all causes, which produce the disease, the worst; proper care is to be taken, that those, who have no business with the sick, are not suffered to go near them. The healthy people are also to be prevented from keeping company with those,

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who have the care of the sick. By observing this, it is probable, that contagion may be avoided, or at least prevented from spreading rapidly. But I hardly believe, that those, whose business it is to attend the sick, can by any one prophylactic be rendered safe against the danger of being infected. However, as I have some little confidence in strong vinegar, which I always smelled to, when among the sick, and as I believe with some benefit, I shall recommend it. The best for that purpose, and which I made use of, is that which goes under the name of *spiritus aceti*, and which is distilled from the diuretic salt, or from some metallic salt, containing the acid of vinegar in a concentrated state. *Sal polychrest* or *tartarus vitriolatus*, to which a few drops of this concentrated acid are added in a phial, exhale a most penetrating sour and volatile smell, which may be easily mistaken for the smell of the salt itself by those, who do not know its preparation. Those salts, thus prepared, are easier preserved in phials, and may be carried about more conveniently for occasional use, than the pure volatile acid by itself. They go commonly by the name of salt of vinegar, but improperly; for though it has been found, that this *spiritus aceti*, or volatile acid, will form crystals, when properly

perly evaporated*, yet on account of its great price it is seldom found in the shops, but the salts, prepared as above, are commonly substituted in its place. In what manner this acid acts, and how it is able to prevent contagion, is not an easy matter to determine; however, if we suppose the *effluvia* of the disorder to be of a volatile alkaline nature, it is probable, that this *effluvia* is absorbed and saturated by the fumes exhaling from the acid, and that, by being combined in this manner, it loses its power, or is at least prevented from exerting it†. On this supposition it will also be beneficial to sprinkle common vinegar over the dwelling rooms, the barracks, and the wards of the hospital. I would further advise those, who have the care of the sick, not to wear any woollen cloaths, because the contagion is very apt to lodge in them, but to make use of linen

* See Dictionnaire de Chymie de MACQUER. Esprit de Venus.

† I was often seized with a sneezing, attended with a discharge of *mucus* from the nose, and a flowing of *saliva*, when I was among the patients in the hospital, which I partly attributed to the irritation caused by the *spiritus aceti* I made use of. I am, therefore, inclined to believe, that it may have contributed in this manner towards preventing the infection.

or cotton, and shift them very often. They should also take the greatest care, of not exposing themselves immediately to the breath of a patient, than which nothing is more contagious; and they should wash their faces and hands very often with a weak mixture of vinegar and water.

A short Reflection on the Gum Trade of Senegal, and the Importance of the Place on that Account, concluding with an Argument concerning the bad Consequences which must attend the present Mode of sending Convicts to Africa for Soldiers.

THOUGH Senegal seems to be more unhealthy, than the more southern establishments on the coast of Africa, yet as it is the only place on that coast, which produces (exclusive of other commodities) the Gum Senega or Arabic, an article of the greatest consequence in many British manufactories, it was on that account a very valuable settlement to this country.

The French had been in quiet possession of it upwards of eighty years, until the year 1758, when it was taken from them by a small English Squadron, commanded by Captain MARSH, and the marines of it, acting as land forces, by Major MASON. As the French knew the value of the place by the loss of it, being obliged to buy all the gum they use in their own manufactories

nufactories from the English, they made it one of their first conquests in the present war. It appears, however, that the Dutch must also have traded there; for the blacks have retained a few Dutch names for some manufactured European goods, perhaps before that time unknown to them; but this must have been before the French, and after the Portuguese, who were the first, frequenting that country, and settling on the island of Senegal, where they built a small fort, which was afterwards enlarged by the French, and called after the name of St. Louis. During the time that the French were in possession of it, it belonged to their East India Company, and it has been asserted by a Mr. ROUSSIN, who had been there a long time in the Company's service, and who was, after it was taken, in the service of the English as linguist of the Arabic language, that the profits, which the French East India Company derived from the trade at Senegal, surpassed in proportion those of their East India commerce, as being less expensive. At present the French have again put it into the hands of a Company, which certainly will reap the greatest advantage from the gum trade, as they have it in their power to make the Moors lower the price of it, as much as they think proper,

proper, which was not practicable, when it was in the hands of the English; for the trade being free and open to every English subject, it sometimes happened, that seven or eight vessels, belonging to different owners, lay along side of one another at those places up the river, where the Moors use to bring their gum for sale, and the masters of these vessels, eager to obtain full cargoes, out-bid one another, and raised the price of it most enormously, besides giving presents to the chiefs, and paying large customs to the princes, which they took the advantage to extort from them year after year, on which account they made (as I have heard from their own declaration) but little advantage by their voyages, and sometimes were losers, particularly when the markets in England were over-stocked with that commodity*. If, therefore, Senegal should ever be retaken by the English, it would be best, in my opinion, to put it into the hands of a company, which certainly would reap the greatest profits from its trade. Forty, fifty, or sixty soldiers would be sufficient to garrison it in time of peace;

* In the year 1777, when Senegal was in the possession of the English, the gum arabic was sold in London at thirty or thirty-five pounds sterling a ton, and now it has risen to the enormous price of two hundred and forty and upwards.

but those should not be convicts. The inhabitants of the island, who are in great number, will, for the protection of their own property, always assist the garrison, in case it should be attacked by any nation from the continent. The present mode of sending convicts for soldiers to the island of Goree, does more harm to the English nation in that quarter, than is generally imagined. These fellows continue to exercise their old villainous tricks, and if many or even a few of them are concerned in malpractices, the punishing of them may be attended with sedition and mutiny. I say this from my own experience ; for though we had no real convicts at Senegal, yet we had some as bad. Out of the number of twenty-two, which had been spared by the disease, thirteen rose upon the Commandant two days before the French invested the island, the other nine being then sick in the hospital. They shut him out of the fort, and fired immediately upon him and upon the innocent blacks round about the fort, and killed eight or nine of the latter. This mutiny was partly occasioned by a dispute among the officers concerning the succession to the command of the garrison after Governor CLARKE's death, and partly by the thievery of the soldiers, for some of them had
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broken open a magazine, and stole a quantity of merchandise from it, which the Commandant discovering confined them, after which the others, who seemed likewise to be concerned in this matter, in order to screen themselves from punishment, took the side of his competitor, and called him to the command, to which he had been appointed by a superior officer residing at Fort James, Gambia, but was prevented from taking it by those very soldiers, who had till that time supported the former against him.

The arrival of the French at this critical period was in all probability the most lucky circumstance, that could have happened, as the most fatal consequences were likely to be the issue of this affair; for the resentment, rage and fury of the blacks at this unprovoked murder of their innocent countrymen was so great, that it was not only seriously apprehended, but really dreaded, that they would, in revenge thereof, have massacred every white person belonging to the garrison, as well as some traders on the island, and of course the innocent with the guilty; fifteen hundred of them at least being at that time under arms at the upper and lower part of the island. This matter, however,

ever, has, to my great surprize, never been inquired into after our arrival in England, which I cannot attribute to any thing else, but that Government never was rightly informed of it.

The blacks, who are neither so void of sense nor irrational, as they are imagined by many to be, are apt to judge of the English nation in general by those out-casts; for the greater part of them do not know, that they are sent there for horrid crimes. The soldiers themselves will certainly not reveal it, and it is not much to the honour of the officers, who command them, to declare it. On the other hand, those of the inhabitants, who know it, think themselves very hardly treated by the English government, that they should send such wretches among them. To prevent, therefore, any false prejudices, the natives may form and entertain of the English in general, to gain their affection, and to insure the possessions in that country, the sending of convicts there for soldiers should, in my opinion, be dropped by a nation deservedly ambitious of its good fame, laws, and government.

ERRATIC

PAGINATION